
XII. *An Historical Account of Testaceological Writers.*

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EXPERIENCE having fully evinced the necessity of system in describing natural objects, it has always been an useful and pleasing task to trace its formation and progressive improvement: and though, until Linnæus drew the outlines of his *Systema Naturæ*, there were no plans of *universal* arrangement to which modern inquirers can feel much interest in turning their attention; yet, with respect to *particular* branches of natural history, we shall find no one that has not engaged the labour of studious men from the very infancy of learning, and that has not, in its progress towards perfection, called forth every variety of talent. Thus the vegetable kingdom, in the contemplation of which mankind in every age have placed one of their purest pleasures, is seen to have employed the pen of science in a multitude of attempts at method, giving rise to a diversity of details and discriminations, and gradually increasing its claims to importance through an endless series of authors. Aware of the advantages which must always result from the review of successive systems, and from digesting the claims of those who had preceded him, the great Swedish naturalist presented us with an excellent model for this species of history in his *Bibliotheca Botanica*. If botanical writers deserved this enumeration of their labours, and if the
 science

science itself could obtain so valuable a register from the hands of its illustrious reformer, we may be allowed to express our wonder at a similar history of authors not having been executed, as an aid to all other departments of natural history.

It is now some years that the writers of this paper have devoted much attention to the study of the *Testacea*; and in preparing a systematic catalogue and description of such species as inhabit the British islands, they had much reason to lament being unprovided with any professed and complete history of this branch of zoology, to assist them in collecting synonyms and comparing figures and descriptions. Excepting the *Fundamenta Testacologiae*, contained in the *Amanitates Academicæ*, there is no work that exhibits the progress of the science, or treats of the merits of writers, at all in a satisfactory manner. In order to supply this defect, so far at least as our own means of research have extended, and with a view to some explanation of the references which we may have occasion to employ in a future paper, the following sketches are submitted to the Linnean Society. With regard to the order of them, the chronological has appeared to us to be the most eligible; but, as a methodical classification of authors may also be useful, subjoined to the historical part of this paper is a list of their names and works, arranged according to the subjects of which they treat. We have omitted, however, mere *catalogists*, and such authors as have treated of the *Testacea* only in a casual manner, conceiving that an enumeration of such performances would protract this paper to an undue length, without adding any thing particularly curious or important to the history of the science. If several authors of a higher order have not been inserted, it is either because they are not accessible to the generality of our countrymen, or because they have copied others too nearly to be allowed the merit of originality.

With

With respect to the general execution of our task, it is incumbent on us to solicit the indulgence of this learned Society, by whom we hope those deficiencies will be pardoned which have not proceeded from neglect of means of information within our reach.

ARISTOTLE,

the illustrious father of system in general, seems to have been also the first writer, and the inventor of method, in Testaceology. In his *History of Animals* (book iv. ch. 4.) we find a copious description of that tribe to which he has affixed the term *Οσραχοδεγμα*, a term apparently intended to include all such animals as are contained in a shelly covering. It is remarkable enough, that the very first attempt to reduce the species of this tribe under a regular system was so far successful that its outline stood the test of subsequent discoveries, and was retained in Testaceology to a late period. It was Aristotle who formed the divisions of

1. Univalves,
2. Bivalves, and
3. Turbinated Shells;

and the terms which he applied to several subdivisions, or *genera*, remain, as well as the *genera* themselves, in all modern systems. The terms *Lepas*, *Solen*, *Pinna*, and *Nerita*, may serve as examples. Of the animals themselves, distinctly from the shells, this philosopher (as might naturally be supposed) possessed but a very imperfect knowledge; yet he saw the necessity of connecting the structure and habits of them, as far as was possible, with the form of their coverings, in the framing of a scientific system. Thus, in his *genera* of *Cocalia*, *Purpura*, and *Buccina*, he expressly describes the head and flesh of the included reptiles. Aristotle's merit, however, was only that of having established some philosophical and permanent distinctions. The number of shells known

in those ages was very confined; many of the mere appendages of testaceous animals, such as *opercula* and detached valves, were mistaken for distinct species; and a variety of families were constituted on the most absurd principles. Yet, with all these defects, Testaceology experienced no improvement from the great Roman naturalist

PLINY,

who is chargeable with a greater fault than that of having left no better an arrangement than he found, for he seems scarcely to have adopted any arrangement at all. In the 9th book of his *Natural History* he gives a pretty diffuse description of Testaceous animals, but in a very vague and unmethodical manner. In Pliny's time the Romans must have had considerable opportunities of increasing their knowledge of shells, for their navigation had been much extended; and with respect to the Mediterranean in particular, their augmented acquaintance with its coasts must have been the means of importing into the capital of the world a great variety of new species. The manner in which this diligent naturalist alludes to the diversified form, colour, and magnitude of these beautiful objects, sufficiently shows that he had viewed no small number, and that he found in them ample sources of interest and admiration.

It ought to be remarked, that there are commentators who have bestowed particular attention on that part of Pliny's works of which we have been treating, and whom the curious scholar may do well to consult. Among these L. Gronovius, Franciscus Mas-sarius*, and Klein, deserve respectful mention. There are also some annotations in the *Leipsic Commentaries* for 1773.†, illustrative of the Roman naturalist's terminology.

* Basil, 1537, 4to.

† Fischer. p. 487.

ÆLIAN

does not omit the Testaceous tribe in his work *Περὶ Ζῴων ἰδιότητος*: but that philosopher's knowledge of the habits of these animals was of course very limited, and the chapters dedicated to such subjects are, therefore, very concise. It ought, perhaps, to be mentioned, that the distribution of his matter is still more vague than that of his predecessors, and much superstition is mixed with it.

After the dark ages, one of the earliest writers on the subject of natural history was

VINCENTIUS

(a Dominican monk of Beauvais); but he does not treat of any branch of that science otherwise than specifically, attempting no general arrangement, nor dividing his work otherwise than into books and chapters. His "*Speculum Naturæ*," in the vast compass of its curious matter, contains descriptions of a few of the more remarkable shells, as the *murex*, *purpura*, *ostrea*, &c. but they are borrowed chiefly from Aristotle and Pliny, and are replete with the absurd and superstitious notions of the times. The year following

ALBERTUS MAGNUS

published his volume "*de Animalibus*," &c. in which are similar scattered descriptions of various shells, without any scientific order, or much original information.

ADAM LONICERUS,

in his "*Historiæ Naturalis Opus novum*," introduces figures of shells, and describes a few species under the heads of *Cochleæ* and *Conchæ*: but he is extremely concise; a circumstance for which

he apologises, by remarking, that persons who reside in the vicinity of the sea are alone competent to attempt a full description and a scientific discrimination of the *Testacea*.—We have next to mention

BELON,

famous for his travels in the East, and who was, perhaps, one of the first learned men that travelled with a particular view to natural science. In 1553 he published at Paris an octavo volume "*de Aquatilibus*," accompanied by figures, among which are a few shells not incorrectly represented, but the description is scanty and superficial. The succeeding year

RONDELETIUS

(Professor of Physic at Montpellier), whose situation had given him many opportunities in this way, published on the same subject in a work bearing the title of "*Universa Aquatiliū Historia*." In the second part of this work he has described and figured upwards of one hundred species of Testaceous animals. He has quoted largely from Aristotle and Pliny, interspersing his descriptions with philological remarks, which are, in many instances, more copious than those which relate to the nature of the creatures themselves.

In the different editions of the Commentaries of

MATTHIOLUS

the cuts are very different, both in accuracy and dimensions, and still more so in number. The first edition of this work contains figures of only nine species of shells; the blocks seem to have been afterwards borrowed by the Spanish booksellers (a practice very common at that period), and hence the figures of the Salamanca edition of 1566 are the same. In the Italian edition of 1565
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some of these figures were omitted, and some new ones introduced, so as to render the whole number fourteen, and they are considerably larger than the former. In the Lyons edition of 1572, by des Moulins, some of the species contained in that of 1554 are introduced (but with the omission of one contained in the edition last mentioned), and the figures are all original. They were copied by the Venetian publishers in 1621, but were in some instances transposed and reversed. Bauhin, in his publication of this work, copied pretty accurately that of 1572, so far as the figures are concerned; as did also Pinet, who, however, reduced the size of them very considerably, and inserted only ten species. The edition of 1683 we have never seen. Matthiolus is pretty copious in his descriptions of the shells mentioned by Dioscorides, but they are derived chiefly from the perusal of authors whom we have already mentioned.

GESNER.

In 1558 appeared the work of Conrad Gesner "*de Piscium et Aquatiliū Animantium Historia*," in which may be found all that was known by the ancients, and by this author's immediate predecessors, relative to *Testacea*. Well might Boerhaave bestow on Gesner the appellation of "*Monstrum eruditionis*,"—an appellation to which this indefatigable writer was justly entitled, for the extent of his learning, and the excellence of his comments on the writings of antiquity. His figures of shells are, for the most part, extremely rude; but, in general, the species intended to be represented may be pretty readily recognized, and they are accompanied by very ample descriptions. In the "*Icones Animalium*" of this author we find several shells of the Indian and Arabian seas, which had never been figured before, and which prove that he was not content, even in a part of his work comparatively so in-
considerable,

considerable, to detail what was known by his predecessors, without making additions of his own. With regard to system, Gesner trod pretty nearly in the steps of Aristotle. In making a fourth class, denominated *Anomala*, he can scarcely be said to have *improved* the arrangement of the Grecian philosopher; and even if his *genera* of *Balani*, *Penicillæ marina*, *Tubuli marini*, and *Echini*, can be considered as more properly placed here than in any one of the Aristotelian classes, it was certainly very injudicious to include the *Stella marina* and *Medusæ* among Testaceous animals.

LINOCIER,

the well-known copyist of Gesner, gives a brief account of a few shells, with figures, in his "*Histoire des Poissons.*"

IMPERATO.

Francesco Imperato was the editor of a work on natural history composed principally by his father. The figures, which are far from being either rude or incorrect, relate principally to fossils: they are few in number, but the description of shells occupies several pages, and, though devoid of system, proves the author to have paid considerable attention to this branch of zoölogy. Besides giving the labours of his father to the world, Francesco published two treatises of his own, one entitled "*de Fossilibus Opusculum,*" and another, "*Discorsi intorno a diverse Cose Naturali.*" Both of these came from the press at Naples, and deserved, as well as the work first mentioned, to be considered as very respectable additions to the scientific literature of that day. The treatise on Fossils contains some figures under the correspondent descriptions; but the miscellaneous work is destitute of any, and indeed does not treat particularly either of recent or of fossil shells.

ALDRO-

ALDROVANDUS

followed the disposition of shells adopted by Gesner, except that he inverted the order of the classes, and altogether omitted the objectionable one of *Anomala*. His work "*de Mollibus Crustaceis, Testaceis, et Zoöphytis*," is divided into four books. The figures are coarse and inaccurate, and less fit for reference than those of, perhaps, any other of the older writers on this science.

COLUMNA.

The treatise of Fabius Columna is to be considered rather as a *Monographia* of the *Purpura* than as referable to shells in general; but it contains descriptions of a few rarer species, and of some fossils also, which are all neatly figured in seven copper plates, exclusive of the one attached to a dissertation on *Glossopetræ*.

This work was re-published in 1675 by John Daniel Major, M.D. whom we shall notice hereafter.

In the same year with Columna's Treatise on the *Purpura* appeared the excellent plates of

BASIL BESLER

(apothecary of Nuremberg), well known among the naturalists of that period, particularly for his attachment to botany. These plates are highly finished, and perhaps altogether superior to any that had appeared before on copper relative to subjects of natural history. Two of them only contain figures of shells, the lovers of which must lament that there are no more, so elegantly and correctly are they executed. There are specific descriptions in Latin and German. The work has for its title "*Fasciculus Rariorum*," &c. and, though inconsiderable in its extent, well deserves a place in the library of the curious naturalist.

CHIOCCO,

CHIOCCO,

the describer of the "*Museum Calceolarium*," gives a very full account of the shells contained in that collection, with specific characters, in the Latin language. These descriptions, however, are for the most part borrowed from other writers. The book itself must have been looked upon in those days as very superb and expensive, and was certainly worthy of the museum which it professes to describe. This museum was begun by Benedict Ceruto, a physician, and even before it received additions from Calceolari, contained an immense assortment both of natural and artificial subjects. The figures of the shells occupy six plates, and are very correctly executed. It appears to be the first work that was written professedly as a *description* of a museum of natural curiosities, if we except OLIVIS account of the same collection, which, however, is very vague and imperfect.

The forming of collections began about this period to be undertaken by many curious persons, especially in Italy and Germany, countries where, in common with other branches of science, natural history first attracted attention, after the revival of letters.

SCHONVELDE

(a physician of Hamburgh) was author of an account of marine, lake, and river animals found in the duchies of Sleswick and Holstein, which contains separate chapters on oysters and muscles, *pectunculi*, and *pediculi aquatici*. The work is of a very superficial nature, and relates chiefly to the culinary uses of the animals.

NIEREMBERGIUS

may be included in our list, as having given some account of various *Testacea* in his "*Historia Naturæ*;" but he does not present us
with

with figures of any species, nor are his descriptions on this subject at all full, except where he treats of pearls.

About twenty years after the publication of the *Museum Calceolarium* there appeared a performance of a similar nature in the "*Gazophylacium Rerum Naturalium*" of

MICHAEL RUPERT BESLER

(the brother of Basil), whose plates were in the first edition twenty-four in number, representing, among other subjects, a few figures of shells, some of which, however, are formed artificially into ridiculous similitudes of human heads, &c. There is a concise description in Latin under the respective figures. In the second edition, the number of plates was augmented to thirty-five, with a German preface; but in this, as in the former publication, the majority of the subjects relate to artificial curiosities. Nothing can be more incommodious than the size of the book, which is almost twice as large as that of the copper-plates.

The museum of

WORMIUS

contained many species of *Testacea*: but the author vouchsafed figures of none of them, except *Lepas aquatifera*; and this was one that might well have been spared, being copied from Marcgrave's *Nat. Hist. Brasiliae*, which is referred to by Linnæus for that species. Connected with it we have the whole of the ridiculous story, so generally received by the credulous naturalists of that day, respecting the *Barnacle Goose*. Chapters 6, 7, and 8 of the "*Museum Wormianum*" relate entirely to shells, divided, according to the Aristotelian classification, into *Univalvia*, *Bivalvia*, and *Turbinata*.

The volume of which we have been speaking was preceded by the synoptic catalogue of SEGER, printed at Copenhagen in 1653.

An account of the collection of natural curiosities belonging to an Italian nobleman of the name of

MOSCARDO

made its appearance at Padua. Several species are figured in this work, those of shells occupying twelve copper-plates, but they are not very elegantly nor correctly represented. There are no *general* descriptions, the subjects being noticed only specifically.

There was another edition of these *Note* published in 1672 at Verona (the city where Count Moscardo resided). This contained some wooden cuts besides the copper.

JONSTON

(who was a great compiler and copyist with regard to description) deserves but little credit, except for the number of his figures, which were also more highly finished than had hitherto been customary in these branches of pursuit. His "*Historia Naturalis de Exanguibus Aquaticis*" contains twenty copper-plates of *Mollusca* and *Testacea*, but there is no regular distribution of the individual figures, nor any remarkable accuracy in their design.

This author describes a few of the more remarkable shells in his *Thaumatographia Naturalis*, printed in 1665.

POWER

gives a pretty full account of the structure of *Helix lucorum* in his *Exp. Philosophy*.

DE ROCHFORT,

author of the *Histoire Naturelle et Morale des Isles Antilles*, is pretty full in his description of the shells of those isles, but with no pretensions to system. His 19th chapter is illustrated by a pretty

pretty accurate plate of five of these, which he considered as most remarkable for their beauty and shape.

In 1666 the museum of the Duke of Holstein-Gottorp was described by

ADAM OLEARIUS.

A second edition of this work came out in 1674. Each is embellished with thirty-six remarkably neat and good copper-plates, five of them containing shells, which are referred to by Linnæus in various parts of his *Systema*.

DU TERTRE,

who succeeded this author in the same undertaking, has done little more than having corrected what he considered as mistakes in his predecessor, with respect to the natural history of the Caribbee shells, but his work is three times as large.

MERRETT,

though scarcely entitled to the character of a describer, seems to deserve a place in our account of Testaceological writers, as having been the earliest catalogist of the natural productions of Great Britain. The *Testacei* (as he calls them) occupy but little more than a page of his *Pinax*, and his references are only to Rondeletius, Gesner, Aldrovandus, and Jonston.

CHARLETON

is to be considered rather as a nomenclator than as having any pretensions to the rank of a systematical writer, yet he constructed some subdivisions of his own in the classes before established. He separated the *Turbinata* and *Bivalvia* into two orders, which are very ill conceived, especially those of the last men-

tioned class, the distinctions of *Concha aspera* and *laves* occasioning the disunion of several obvious natural genera. The "*Onomasticon Zoicum*" certainly deserves respectful mention, inasmuch as it was the earliest production of the kind that was published in England: The author, who was a physician of considerable learning and celebrity, had before distinguished himself in the science of natural history by his "*Exercitationes de Differentiis et Nominibus Animalium*," published at Oxford in 1677.

STENO

cannot, with propriety, occupy a place in our historical account of Testaceological writers on any other ground than that of having been the author of several curious remarks on the mode of formation of shells. These remarks occur in a work, the title of which certainly does not indicate any connexion with them, viz. "*De Solido intra Solidum naturaliter contento Dissertationis Prodrromus*." It is (properly speaking) a treatise on crystallography, but contains some pages on the subject of shells that are highly deserving of attention, as they form the earliest attempt to explain in a scientific manner the fabric and texture of testaceous bodies.

BOYLE,

our celebrated countryman, is not undeserving of mention here, having made experiments on the phænomena of shell-fish (particularly of the *Ostrea edulis*) under an exhausted receiver; which experiments are described in the *Philosophical Transactions* (vol. 5. p. 2023.) of the year 1670. It is but right to regard whatever elucidates the nature, even of a solitary individual, of the testaceous tribe, as subservient to the accuracy of systematical arrangement; and we shall, therefore, not omit to point out in the course
of

of this dissertation every source of information connected with the history of these animals.

WILLIS,

the celebrated physiologist, has very accurately figured and described the anatomy of the *Ostrea edulis* in his *Exercitationes de Anima Brutorum*.

The annotations of

MAJOR

on the elegant and learned treatise of Fabius Columna have been alluded to before: as the annotator himself was the author of a system, he is entitled to specific mention in the proper chronological place. This system is annexed to a republication of the history of the *Purpura*, together with a "*Dictionarium Ostracologicum*," the most useful part of Major's performance. He adopted a new and elaborate method of distributing *Testacea*, founded principally on the species described by Columna himself, whose figures (twenty-five in number) are copied in wood-cuts placed in the systematic as well as in the descriptive part: among them are several fossils of the genera of *Chama* and *Anomia*. The method, however, is infinitely too complicated and ramifying to admit of any useful application. The dictionary exhibits an explanation of all the terms then employed in Testaceology, pointing out the respective authors by whom they were first introduced, and tracing out, in most instances, the derivation of them. The terminology of modern systems is, evidently, far from being chiefly of modern invention, and it is curious to remark how many of the designations established in the *Fundamenta Testaceologie* may be found in the earliest glossary connected with that science, the *Dictionarium Ostracologicum* of Major.

When

When alluding to this writer's system, we ought to have mentioned that, fond as he was of numerous subdivisions, the *classification* (properly so called) is singularly, but not absurdly, simplified, all the *Testacea* being comprehended under the heads of *Univalvia* and *Plurivalvia*. In the latter we find the *genera* of *Conchæ anatifera* and *Balani* (united by Linnæus under the name of *Lepas*), which before the time of Major had been very improperly arranged either among the Univalves or the Bivalves.

LEGATI

is to be mentioned in this place as the author of the "*Museo Cospiano*," printed at Bologna in 1677. The basis of the collection distinguished by the above appellation was laid by the celebrated Aldrovandus, who was, probably, the first person that formed a regular museum, and whose handwriting still remains affixed to many specimens that formed the subjects of Legati's descriptions. Ferdinando Cospi, a Bolognese patrician, afterwards augmented it so considerably that his name became attached to it, and the University of Bologna, to which it was afterwards presented, considered it as one of its greatest treasures. In the work of which we are treating, figures of shells are very sparingly introduced, but they have the merit of neatness and of tolerable accuracy. There are ample descriptions of *Testacea* interspersed with critical and philological matter.

SIR ROBERT MORAY

was author of a description, illustrated by a rough outline, of *Lepas anatifera*, from which the credulous knight asserts that young geese may actually be seen to emerge. His "*Relation concerning Barnacles*" occurs in the 12th volume of the Philosophical Transactions.

The

The *Helix lucorum* is anatomically described by

HARDERUS

in a dissertation entitled “*Examen anatomica Cochleæ terrestris domiportæ.*” This author published also a few anatomical epistles (relative to the genital organs of some of the Univalves), which are annexed to his translation of Marsigli’s work hereafter to be mentioned.

The museum of the Royal Society of London next acquired the celebrity it deserved from the descriptive catalogue of

GREW.

This was the earliest work of the kind that appeared in our native language. The shells are described in two chapters (the first comprehending Univalves, and the second Bivalves and Multivalves), illustrated by four good plates, each of which contains eight or ten species, with the current English names annexed. There is a general scheme subjoined, which remains a proof of the pains taken by the author; but it is complicated, and exceptionable in many respects. The natural and artificial curiosities at that time possessed by the Royal Society were preserved in Gresham College; they now, as is well known, form a part of our great national collection in the British Museum.

BUONANNI.

Contemporary with Grew was the learned Philip Buonanni, an Italian jesuit, who may be considered as the first author that treated at any length, exclusively, on the subject of shells, and whose figures are very frequently referred to in the *Systema Naturæ*. His work was first printed in his own language, but was
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three years afterwards put into a Latin form, under the title of "*Recreatio Mentis et Oculi in Observatione Animalium Testaceorum.*" It contains upwards of five hundred figures, not remarkable, however, for their accuracy; the apertures of the Univalves are, in many instances, represented as turning to the left instead of the right. The descriptive part is loose and desultory, and exhibits few marks of scientific distribution, except the general division of the subject into

1. *Univalvia non turbinata,*
2. *Bivalvia,* and
3. *Turbinata.*

In the inferior divisions this author has strangely separated species naturally allied to each other. For instance, the *Serpula*, *Dentalia*, &c. are left out of his first class, and, as well as the *Porcellaneæ*, distributed under the third; and, with equal want of consistency, he places the *Haliotis* and *Nautilus* (genera manifestly turbinated) among those which he terms *Univalvia non turbinata*. But it should be remarked, as a circumstance highly creditable to Buonanni, that, in many instances, he has given the *loci natales* of his species, which were too little attended to by testaceologists of that age. He has also treated of the formation of shells in a manner more philosophical than could have been expected at such a period. The subjects for his engravings were obtained principally from the famous museum of Kircher, which was afterwards separately described by our author under the title of "*Museum Kircherianum.*" This volume contains forty-six plates and five hundred and eighty-six figures of shells (besides those illustrative of other parts of the collection), and the descriptive and physiological matter of Buonanni's original work.

An elegant little work relative to the *ova* of *Testacea* was published by

MARSIGLI.

It bears the title of “*Relazione del Ritrovamento dell’ uova di Chioccioline di A. F. M. in una Lettera al Sign. Marcello Malphigi.*” One plate only accompanies it. We ought to observe that this author makes very honourable mention of our countryman Lister. Some observations on Marsigli’s account of these *ova* were published by a few years afterwards FULBERTI, whose work is commonly found in the same volume with the former.

Among the *Observazioni Naturali* of

BOCCONE

there occur some remarks relative to *Testacea*, which are not uninteresting. Boccone seems to be the first author who has described fully the *Lepas diadema* of Linnæus, which, from its been seen adhering to the back of a whale, was denominated *Pediculus ceti*.

An anatomical description of the common muscle was published the same year in the *Leipsic Commentaries* by

DE HEIDE,

which description also appears in Valentini’s *Amphitheatrum Zootomicum*.

The purple fish was described at considerable length in the *Philosophical Transactions* by

COLE,

who has taken considerable pains in pointing out the mode of obtaining, and the nature of, this celebrated dye. *Buccinum Lapillus*, the species alluded to by this author, is figured in an annexed plate. This tract was reprinted in 1689, and sold separately.

LISTER.

There is no name in the annals of natural history that deserves to be mentioned with more respect than that of our countryman Dr. Martin Lister, to whom, in this historical catalogue, we have given the place appropriate to the time of the publication of his *Synopsis*, or general work on shells: but, as this was far from being the first in order of his publications, we shall beg leave to preface our account of it with some remarks on his earlier productions. We may be permitted, perhaps, to be less concise on the subject of this celebrated writer than we have shown ourselves with respect to most of his predecessors, when it is considered that he was the father of British Testaceology, and that in the labour, accuracy, and extent of his works, as well as in the philosophical spirit with which they were executed, he has far surpassed all the writers of that period. His figures, both in point of number and faithfulness, are with reason still held in such high estimation, that no person attached to this branch of natural history can advance in it without the constant use of them, nor without finding them preferable for reference to many *more splendid* engravings which have succeeded them.

The earliest essays of Lister on the subject of the *Testacea* appeared in the *Philosophical Transactions*, that general and useful receptacle for accidental and detached discoveries in natural science, for the preservation of which the Royal Society was instituted, and to which our indefatigable countryman was one of the earliest and most valuable contributors. His first communication was (anonymously) on the subject of heterostrophous shells. At this time he was living at York, whence some subsequent communications were dated, and where he made many of those observations relative to zoology and fossils which formed an important

tant part of his "*Historia Animalium Angliæ.*" Previous to the publication of this work, however, he exhibited a specimen of his arrangement of the British *Testacea* in some tables printed in the 9th volume of the *Philosophical Transactions*, in which collection nothing of a similar nature had ever before been inserted. The three treatises which composed the History, and which related to spiders, to land and fresh water shells, and to those that inhabit the sea, were published in a quarto volume in the year 1678, with a distinct tract relative to fossils. They were accompanied by twelve copper plates, the first four of which illustrate the descriptions of the insects, and the eight others those of the recent and fossil shells. With respect to system, it must be confessed that the author was far from having attained either simplicity or accuracy; it had for its basis the very unphilosophical distinction of the *abode* of the animals, and in its subdivisions the ramifications were too numerous to be referred to with facility. The paucity of generic terms also formed a lamentable defect. His principal object, indeed, (as he himself informs us in his preface,) was to render the description of *species* as ample and accurate as possible; and he expresses himself with so much good sense and genuine science on this point that we cannot forbear inserting his own words in this place: "*Illud autem (says he) in hoc opusculo præcipue institui; nimirum, singulorum generum bestiolas quam accuratissime in species diducere; cujus illa certe singularis utilitas esse possit, ut si quæ in posterum præclara experimenta de his animalibus aliorum industria confecerit, ea tuto huc referri possint, suisque quæque locis recte disponantur. Mihi interea illud satis superque est, ea primum nostra animalia seculo indicasse rerum naturæ studiosissimo. Qui vero simile opus aggressi fuerint, ei tantum intelligent quantum sudavimus, resque adeo minutus vel extrema linea certo cognoscere esse aliquid. Cum autem pleraque, quæ hic habentur,*

ad fidem sensus referri possint, in id maxime incubui ne ipse primum deceptus posteros in errorem ducerem. Summam sane diligentiam adhibui, ut veras species distinguendo, non multiplicando citra necessitatem singulis, minutissimis licet, fidelissimis tamen observationibus, quæ ad animalium mores vitamque spectarent, exornarem." Some additional species, with further remarks on many before described, were figured in an "Appendix," which went through two editions, the first being published in quarto at York in the year 1681, and the latter subjoined to his edition of Gædart's Insects. This entomological work was published in an octavo form, with twenty plates, two of which contain figures of shells. The original "Appendix" is now become very scarce.

It was in the year 1685 that Lister commenced the publication of his great Testaceological work entitled "*Historia sive Synopsis methodica Conchyliorum,*" which was divided into four books, besides a *mantissa*.

Lib. 1. *De Turbinibus terrestribus.*

2. *De Turb. aquæ dulcis et Bivalvibus aquæ dulcis.*

3. *De Bivalv. marinis, et Conchis anatifervis.*

4. *De Patellis, Dentalibus, &c. et de Buccinis marinis.*

The plates (which were 1057 in number) had very different dimensions; in some instances containing a single figure, in others several figures, and not unfrequently more than one distinct species on the same plate. Concise descriptions are engraved on most of them, with references, wherever they could be given, to the places whence the specimens were brought. Our author seems to have been principally indebted to the museum of Mr. Courtein for the means of representing and describing those species with which he was not himself provided; but that his own collection was not deficient, either in number or perfection of specimens, is evident from what remains of it in the Ashmolean
museum

museum at Oxford. To this University the plates themselves were also bequeathed, and there they were republished in 1770, under the direction of the *Rev. William Huddesford*, keeper of the Ashmolean museum, who subjoined two *indices*, one connected with Lister's own distribution, and the other with the Linnean, to which last were affixed as many of the current English names as the editor was acquainted with. This edition differs from the former principally in containing several plates on one page: the whole number is 1085 (28 more than are comprehended in the first edition), but there do not appear plates 89, 164, 195, 196, 222, 923, 961, which were contained in the original. The number of figures amounts to no fewer than 1153, exclusive of the fossils and anatomical subjects. These, however, are not to be considered as so many distinct species, since there is, doubtless, a repetition of several, which the author, on account of difference of colour and stages of growth, did not imagine to be the same. We ought not to omit mentioning that the delineations of all these, for the most part so accurate, came from the fair hands of this celebrated naturalist's daughters, *Susannah* and *Ann Lister*, whose names deserve to descend to posterity with their father's, and whose truly meritorious industry and ingenuity are patterns for their sex.

The researches of Lister were by no means confined to the mere coverings of *Testacea*. So far was he from contenting himself with pointing out the beauty and variety of the *shells*, that he not only collected as much as was in his power relative to the habits of the *animals*, but also devoted great pains to the illustration of their *anatomical structure*. He published three separate "*Exercitations*," each exhibiting dissections of *Vermes*, and containing ample descriptions, in Latin. The first "*Exercitatio Anatomica*" relates chiefly to the *Limaces*. Of the second (to which

was

was subjoined a dissertation on Small-Pox) the *Buccina* formed the principal subject. The last relates to bivalves: it contains also a dissertation on the human calculus. The "*Anatomy of the Scallop*" formed the subject of a distinct paper, published under this title in the 19th volume of the *Philosophical Transactions*.

FEHR

wrote a dissertation on the *Argonauta Argo*, which is printed in the *Eph. Acad. Nat. Cur.* There is a correct engraving of this species subjoined to it.

The same year an academical dissertation on the *Purpura* was published at Upsal during the presidency of

NORMANN,

El. Bask being the respondent. This contains a disquisition on the purple fish of the antients, but without definitively marking any particular species as being employed by them for extracting the famous Tyrian dye. A wooden cut is prefixed exhibiting three figures, two of which are copied from Jonston (and seem to be referable to *Murex Brandaris*) and the other from Columna.

Some observations in the *Eph. Acad. Nat. Cur.* by

SCHELHAMMER

ought, perhaps, to be mentioned here. Two of this author's communications are on the subject of fresh water shells, and are accompanied by a few figures, which are pretty correctly executed. The author pretends to give only a concise account of some species which he had recently noticed, and it is too imperfect to merit being referred to. A third communication is entitled "*Animal in Cochlea minuta depressa degens*;" this relates rather to the physiology of the animal (a *Helix*) than to the testaceous covering.

The

The *ova* of some species of *Ostrea* were treated of in the same work by

BRACHIUS,

whose observations, however, were very scanty, the account of them not extending beyond three pages.

DU MOLINET,

author of "*Le Cabinet de la Bibliotheque de Sainte Genevieve*," is scarcely entitled to a place among the writers who form the subjects of this paper, his work treating almost wholly of antiquities. Among the plates, however, (which are finely executed,) there is one containing twenty-one figures of shells, which are accompanied by names and concise descriptions in the French language.

In the 17th volume of the *Philosophical Transactions* we find some communications on the subject of shells addressed to Dr. Lister by a naturalist of the name of

BANISTER,

who resided many years in Virginia; but his descriptions are too vague to enable us to ascertain what species he alludes to. In the same volume is a "Description of certain Shells found in the East Indies, communicated to Dr. Lister" by

WITZEN,

who figured many of them, but was not sufficiently precise in his description to enable the reader to determine all the species. The best figure in the plate is that of an *Ostrea* found at Goa.

A similar work to Du Molinet's was the description of the museum of Christian V. king of Denmark, whose librarian,

OLIGER

OLIGER JACOBÆUS,

drew up an elaborate volume, under the title of "*Museum Regium.*" It is a very handsome work, but contains no attempt at system, and the tenth plate is the only one relative to Testaceology: indeed this represents only an ornamental fabric composed of shells. In the new edition published by LAUERENTZEN a few species are added, though in a very indifferent style, and there is not much augmentation of the descriptive part. An alphabetical index, in two parts, one of which relates to the artificial, and the other to the natural subjects, was published in 1726.

SIBBALD,

though best known by his "*Scotia illustrata,*" ought to be mentioned here, as having been the author of a general Testaceological work, bearing the title of "*Auctarium Musei Balfouriani.*" This work, however, does not treat of *Testacea* exclusively, but comprehends a variety of subjects, both of art and nature, which were contained in the collection of Sir Andrew Balfour, Knight, M. D. — a collection presented to the University of Edinburgh, and considerably augmented by the intimate friend of the donor, who described the whole in the work above mentioned. Unfortunately for the reputation of this University among naturalists, a very small part of the collection is now remaining. "Such," says Mr. Pennant, "has been the negligence of past times, that scarce a specimen of the noble collection deposited in it by Sir Andrew Balfour is to be met with, any more than the great additions made to it by Sir Robert Sibbald." (*Scotch Tour*, 1776. p. 246.) Such is too often the fate of public collections; and so slight or so transient is any respect for the laudable intentions of generous

rous individuals towards public bodies, that common care is rarely taken to preserve from destruction what escapes the hand of peculation and robbery. But to return to our subject: The description of the Balfourian museum treats pretty largely of the specimens of *Testacea* contained in it, being divided into five chapters, agreeably to something like system. The preface contains an interesting account of the most remarkable *musæa* anterior to the formation of the Balfourian, and also of the works which profess to describe them.

One of the earliest and most elaborate of Sibbald's performances in natural history was his "*Scotia illustrata, sive Prodromus Historiæ naturalis,*" &c. published in the year 1684. The attempt, as it was the first made in that country to describe scientifically its several productions, deserves very respectful mention, and will be a lasting monument of the learning and industry of the author; who, however, whether from finding the undertaking too extensive and laborious, or from being discouraged by some severe criticisms on what he had already accomplished, never executed his intention, to write the miscellaneous history of Scotland in all its branches. He answered some of the attacks made on his work in "*Vindiciæ Scotiæ illustratæ,*" annexed to his "*Miscellanea eruditæ Antiquitatis,*" which were published in 1710, and reprinted, with all his folio works except the "*Scotia illustrata,*" in 1739.

With regard to the Testaceological part of the *Prodromus*, it is concise and obscure, and illustrated only by two plates: the system is founded partly on the principles of Lister, and partly on those of Buonanni.

But this was not the only treatise of Sibbald on the subject of shells, for he was the author also of a work entitled "*Nautilogia; sive Exercitatio philosophica de Nautilus aliisque Conchylis navigera*

Similitudine ornatis;" and in an appendix to his "*de Aquatilibus Observationes*" he gave a particular description of *Lepas anatifera*, refuting the ridiculous notions entertained at that period respecting this creature.

Sir Robert was contributor of several papers to the Philosophical Transactions. In volume 19th there is an account of some Scotch shells, addressed to Dr. Lister; and in the 25th volume a description of what the author calls *Pediculus ceti* (*Lepas diadema*, *Lin.*) forms part of a letter to Sir Hans Sloane.

The refutation of the absurd story of the Barnacle Goose was undertaken by many writers about this time, and among others by

ERICUS A MOINICHEN,

whose name is prefixed to a dissertation entitled "*Conchæ anatifera vindicata.*"

In the number of writers who have treated of the physiology of the *Testacea*, the celebrated

LEEUWENHOEK

deserves to hold a distinguished place. His first production on this subject was addressed to the Royal Society, and relates chiefly to the generation of these animals: the *ova* and the intestinal structure of certain *Mytili* are also particularly described. His 95th epistle treats of the *ovaria* of *Conchæ* in general, and is illustrated by some good figures. Another describes the *ova* of different shells. Lastly, in an epistle dated 1717, he gives an account of the tendinous substances belonging to some bivalves; but it is very concise, and introduced only in a cursory manner, when he is treating of the structure of tendons in general.

LEIGH

LEIGH

has figured a few species of *Testacea* in his "*Natural History of Lancashire*," and the figures are not inaccurate; but we find nothing in the descriptive part very worthy of attention.

WALLACE,

also, in his "*Account of the Islands of Orkney*," enumerates such species as had fallen under his notice, describing them chiefly in the words of Lister; and he has figured three of them.

PETIVER.

Though the merit of Petiver was principally that of an ichniographer, yet we are to consider him also as capable of describing the subjects which he collected and figured, with accuracy and science. The *Philosophical Transactions* contain several papers written by him, which show that he considered the study of nature as subservient to more dignified purposes than the mere amusement of the eye, or the ostentatiousness of a museum: those relative to shells are descriptive chiefly of foreign species, and contain the synonyms of Rondeletius, Aldrovandus, Lister, and others of his predecessors, wherever they were applicable. The specimens which he received from the Moluccas are described in the 22d volume of the work we have mentioned, with some additional remarks in the 23d; those from Carolina in the 24th. In the "*Memoirs for the Curious*" we find "an account of bivalves brought from the coast of India." The great assiduity with which Petiver procured animals, plants, and fossils from various parts of the world, caused his collection soon to assume sufficient magnitude and importance for rendering his name well known both at home and abroad; and so highly did the greatest judge of the value of natural curiosities at that period, Sir Hans

Sloane, estimate the museum of our indefatigable naturalist, that he offered him 4000*l.* for it some time before his death. The mode by which he was most successful in obtaining specimens consisted in engaging captains and surgeons of ships to bring home whatever appeared to them curious in the countries which they visited, directing their choice and assisting their judgment by distributing among them printed lists and instructions. At length he conceived the design of publishing engravings of the principal rarities contained in his museum, and in 1702 he commenced its execution, in the work entitled "*Gazophylacium Naturæ et Artis.*" This was divided into decads, and illustrated by what he called "classical and topical catalogues," which, however, did not exhibit, any more than the plates themselves, even an outline of scientific order: neither were they any further descriptive than as they pointed out the native countries of the several subjects, and, occasionally, the commonly received appellations. Yet the work acquires considerable value from the accuracy with which most of the figures are executed, and from its having been so frequently referred to by Linnaeus; as long as whose writings are consulted the *Gazophylacium* of Petiver must remain in repute. A great number of the subjects had never been figured before, especially of the *Testacea*, some of which have not been duly noticed or referred to in descriptions of the correspondent species until within a very late period. There are about fifty *English* shells among the figures. This useful work was completed in two folio parts, each containing fifty plates, which, in another edition, were increased to the number of one hundred and fifty-six, and they comprehend in the whole three thousand figures. In the same volume with the latter edition of the *Gazophylacium* there are twenty-two plates of Amboyna and East Indian shells, with names, references, &c. and containing above four hundred figures (but

(but these were copied from Rumphius); also twenty plates illustrative of animals and plants of the Charibbee islands, and entitled "*Pterigraphia Americana.*" The last, indeed, appeared in the original edition, which formed only one volume; whereas the edition of 1764 was, with the various other sets of engravings published by this author, sufficiently bulky to be divided into two.

PLOT,

the author of the "*Natural History of Staffordshire and Oxfordshire,*" makes some mention in the latter of such *Testacea* inhabiting that county as had fallen under his notice. In his tenth plate we are presented with a figure (viz. 9.) of *Buccinum undatum*, which, if we are to give credit to this author's account, was found alive in Cornbury Park: but it is evident, from his references to Rondeletius and Aldrovandus, that the species found there could be no other than the *Helix Pomatia*. Hence his work should be consulted with great caution.

Contemporary with our countryman Petiver was the celebrated

RUMPHIUS,

not only whose pursuits but whose profession was exactly the same as the former's, as he was originally an apothecary at Amsterdam, where his rich and costly museum acquired the same celebrity as that of Petiver in London. The passion for forming cabinets of natural curiosities, especially of shells, began at this period to be very prevalent in Holland. Rich individuals studied to outvie one another in that country, as much in the expensiveness and extent of their collections, as in the splendour of their equipages and retinue; and the sums which were given for a *Cedo nulli* or a *Wenteltrap* would appear too enormous to deserve belief, if such accounts were not authenticated by the most respectable

able writers of that day. Rumphius himself informs us in his preface to the "*Amboinshe Rariteitkamer*," that a shell described in this work cost no less than 500 Dutch florins.

The book bearing this title contains a description, in the Dutch language, of the more remarkable natural productions of Amboyna preserved in the museum of Rumphius, which are figured in sixty plates, thirty-three of these containing solely shells. The figures were designed by Madame Sybille Merian, so well known by her work on the Surinam insects: they are, in general, correct; but there is a harshness in the engraving which takes off considerably from the beauty of many of the subjects. The description was written by M. Schein Voet, who adopted no very regular method; nor does he appear to have been extensively conversant with preceding Testaceological authors. There was a second edition of the work in 1741; and, indeed, an intermediate publication of the plates by themselves took place, without any letter-press, except a table of Latin, Dutch, and Malabar names. This last-mentioned edition is in more general use than either of the other two.

The great service rendered to science by the industry and liberality of Rumphius, caused him to be received as a member into most of the learned societies of Europe: in that of the *Naturæ Curiosorum* of Germany he obtained the appellation of *Plinius Indicus*, which was richly merited by the vast accession to our knowledge of the productions of that part of the world made by his own researches, and displayed in his magnificent publications. In the *Ephemerides* of the illustrious academy just mentioned appear two dissertations on Testaceological subjects from the pen of Rumphius: the first, "*de Ova Marino, Porcellanis, seu Conchis venereis*," is illustrated by very good figures of *Bulla Ovum* and *Cypræa Arabica*; and the second, "*de Nautilo remigante et velificante*,"

cante," by a plate representing *Argonauta Argo* in the act of sailing. The author, it seems, was enabled to give an accurate account of the construction and movements of that wonderful animal from personal observations, on the Indian seas.

In the memoirs of the Royal Academy of Sciences at Paris for 1706 occurs one of the most excellent Testaceological dissertations that had ever before appeared; it was the composition of the celebrated anatomist

POUPART,

and had for its subject the physiology and pathology of the Muscle tribe. The anatomy, habits, and diseases of several species of *Mytilus* are amply and scientifically described, and there are some accurate figures in two plates subjoined. M. Poupart had before distinguished himself by a dissertation on the motive power of an aquatic *Helix*, which was published in the "*Journal des Sçavans.*"

One of the most distinguished Dutch collectors, contemporary with Rumphius, was

LEVIN VINCENT,

the description of whose museum, however, scarcely deserves to be spoken of here, since it is composed in too general and popular a manner to be of any utility to a scientific naturalist; and the plates (which, notwithstanding, are well executed) represent the several objects in a confused manner, as they were placed in the museum itself: yet a few species of shells, as well as of other natural curiosities, may be pretty easily discriminated. The description we allude to is entitled "*Wondertooneel der Nature,*" and was published, wholly in the Dutch language, at Amsterdam in 1706. But this work was afterwards given, in an abridged form, in Latin and French, with impressions of the same plates.

The

The "*Philosophical Transactions*" of our own country for the following year contain an account of some of the shells of the Philippine Islands, communicated by Petiver from

KAMEL,

many of whose papers occur in that work, and who illustrates his descriptions by references to the plates published by his correspondent.

HANNEMAN

may be considered as the author of an academical dissertation, "*Ostrea Holsatica exhibens*," of which Hans Roslin was respondent, and which was illustrated by a plate. It is copied into Valentini's *Amphitheatrum Zootomicum*, hereafter to be mentioned.

REAUMUR,

whose name is immortalized among naturalists by the perseverance and profoundness with which he studied the structure and œconomy of the smaller animals, deserves to occupy a distinguished place in the catalogue of Testaceological writers. To this illustrious zoologist we are indebted for several admirable dissertations on the formation, growth, and motive powers of *Testacea*. The memoirs of the French academy from the year 1709 to 1717 derive from his labours a large share of their value; and to the details of his various curious discoveries contained in them recourse will be had with delight and advantage so long as the science of nature shall be loved. Each of his papers is illustrated by excellent plates, exhibiting several of the species described, and various parts of their internal structure; and each may be considered as the most complete, with respect to the subjects on which it treats, of any similar dissertations that had hitherto appeared.

The

The natural history of the *Pinnæ*, and the formation of Pearls, were elegantly and amply treated of in a memoir which appeared in the volume for 1717.

The "*Thesaurus Animalium*" of

RUYSCH

contains several figures of shells grouped with corals and other substances, as they stood in the museum; but, his book being a mere catalogue, the descriptions are of little use. The 6th plate, which is admirably engraved, exhibits the shell and contained animal of a species of *Voluta*, which he calls *Buccinum Guienense*. Most of the shells figured in this work are natives of the Indian seas.

The countryman and contempory of Reaumur, and whose only treatise relative to *Testacea* appears among the memoirs of the same learned body,

MERY,

wrote some remarks on the common river muscle, which are both elaborate and diffuse. The anatomical structure of the animal is considered; and we find other descriptions of a miscellaneous nature: but this author seems to have borrowed pretty largely from the labours of others.

MORTON,

the natural historian of Northamptonshire, notwithstanding the number and elegance of his engravings of fossil shells, and his mention of many species of the recent kind, unfortunately has presented us with only two figures of the latter, which occur in his 13th plate: his description of them, however, is in general illustrated by references to Lister.

CYPRIANUS,

the editor of Franzius's "*Historia Animalium sacra*," made very considerable additions to that author's description of the *Testacea*; and though the name of Franzius himself does not seem to deserve a separate place in our catalogue, that of his continuator merits very respectful mention. His 8th chapter *De Testatis* embraces a variety of literary and physiological matter relative to those animals; some notice is taken of systems, and a variety of references are made to preceding writers; but the descriptions themselves are too general to be of any use in the investigation of species.

In 1714 were published the valuable plates illustrative of various subjects contained in the museum of

GOTTWALD,

of Dantzic. These were not accompanied by any description, though they have numbers referring to manuscript notes of the collector. The museum seems to have been particularly famous for the anatomical preparations it included. The plates are one hundred and nine in number, no fewer than forty-three of them exhibiting shells. They are executed with no less accuracy than beauty, and may be considered as peculiarly useful for reference. It is to be lamented, however, that few of the original copies of this work are complete; the one possessed by Sir Joseph Banks is the only perfect one we have seen. (See MULLER.)

BARRELIER,

the French botanist, whose work was edited in this year by the elder Jussieu, did not confine his industrious and scientific researches to plants alone, but was author also of a description of certain species of *Insecta* and *Vermes*, which is illustrated by plates, and comprehended in the volume of his labours. Three
of

of these plates contain shells, and are not ill executed, but the descriptive part is slight and useless.

JOHN HENRY LOCHNER,

the author of a work entitled "*Rariora Musei Besleriani*," unfortunately did not live to enjoy the reputation which, as he was only twenty years of age at the time of completing such laborious descriptions, was so justly due to him. The care of publishing them devolved to his father Michael Frederick Lochner, who was director of the Imperial Academy *Nat. Cur.*, and by whom we are presented, in the preface, with an interesting account of the extraordinary youth so prematurely snatched from the world, as also of the two Beslers, whose collections were so much celebrated in their day. Twenty-four plates out of the forty are the same as appeared in Basil Besler's own work, and there are only three relative to shells. Much of the description is extracted from other authors, and the knowledge displayed in it is chiefly of an antiquarian and philological nature, there being no attempt at system.

VALENTINI,

though his most voluminous work came forth as early as the year 1704, we have named here, on account of his most *valuable* performance not appearing until sixteen years after the former; we allude to the "*Amphitheatrum Zootomicum*." It is true that a large part of the contents of this volume consists of extracts from preceding and contemporary writers, and many of the plates are copied; but, considered with reference to shells, the *Amphitheatrum Zootomicum* has much better claims to attention than the *Museum Museorum*. In the latter the figures of shells are wretchedly executed. In fact, this bulky work relates to *materia medica* as much as to natural history, and the second edition actually bears

the title of *Historia Simplicium*. The testaceological remarks are extremely superficial, and defective in originality.

RICHARD BRADLEY,

though not a professed testaceologist, has not altogether omitted this order of animals in his "*Philosophical Account of the Works of Nature;*" and his figures of the species, though few and scattered, are not unworthy of being referred to. This work in its day must have been considered as an interesting view of the œconomy of nature, being judiciously written, and illustrated by a considerable number of accurate engravings.

Hitherto system in testaceology had made but little progress. That of Buonanni was almost the only one which can be said to have been fully and philosophically exemplified, and its outline was more or less preserved in most succeeding attempts; but its defects and errors, as we have before remarked, were numerous. After having noticed a multitude of mere describers, we now come to an author who is not undeserving of the title of a scientific one, and whose system, so far as marine *Testacea* are concerned (and of these alone he treats), certainly glances at the great clue to simplicity, which was afterwards so successfully and admirably seized by the great reformer of natural history in general. The author alluded to is

LANGIUS.

He is the first whose generic characters are founded on commodious distinctions, the aperture of univalves, and the hinge of bivalves, being particularly considered. These distinctions, however, are not allowed their due importance throughout; for the *contour* of the shell is, in many instances, made the exclusive basis of the definition, and the adoption of this naturally led, as
in

in other systems, to a most inconvenient and perplexed multiplication of *genera*. The parts, classes, and sections also are far from being well conceived, and embarrass, rather than assist, the investigation of the other divisions.

A philosophical account of the growth, generation, &c. of testaceous animals is prefixed to the classification, which consists of three parts; the first having two classes and seventeen *genera*, the second six classes and fifty *genera*, and the third three classes and forty-three *genera*. There are no trivial names, nor are there many original descriptions of species, most of the latter being borrowed from Buonanni, Lister, and Rumphius.

The same year

BRUCKMANN,

of Brunswick, published a dissertation on the *Venus Dione* and a *Cypræa*, and

FRANKENAU,

in the *Acta Acad. Nat. Cur.* on *Chiton punctatus*, under the absurd title of "*Calva Serpentis Americani Diademata*." Each of these is illustrated by copper-plate figures.

VALENTYN.

Though his descriptions, in consequence of being clothed in the Dutch language, do not admit of very general use, yet he has conferred great benefit on Testaceology by his admirable plates, of which there are sixteen (finished in the highest style both of accuracy and elegance), consigned solely to figures of East Indian shells. These plates accompanied the publication of the "*Oud en Nieuw Oost-Indien*," but were re-published, with conchological descriptions only, in 1754.

Valentyn's work may be looked upon as a sort of continuation of Rumphius's. As, like the latter, he was some time resident in
Amboyna,

Amboyna, his opportunities of investigating the natural productions of those shores were extensive. He was chaplain to the Dutch settlement in that island, and in his five parts of the History of the East Indies, he was at the pains of writing every thing he knew relative to the geography, civil history, zoology, &c. of a part of the world from which his countrymen had drawn such various riches.

SLOANE,

a name as familiar as it is dear to naturalists, has a place in our list correspondent to the date of the 2d volume of his *Voyage*, viz. 1725. The preface to this volume assigns the reasons for the long interval that occurred between the publication of it and the first, and these reasons are too much connected with our immediate subject not to deserve mention here. Sir Hans was principally occupied by the care, arrangement, and description of his museum, which in 1702 received the augmentation of Mr. Courtain's valuable stores, and in 1718 that of Petiver's.—In the collection of plates belonging to the 2d volume of the *Voyage* there are two (viz. 240 and 241) that contain figures of shells, with Latin descriptions over each species; some taken from Lister. Our illustrious author being the first person who visited Jamaica and others of the West India islands, purely with a view to the extension of science, his plates and descriptions, of course, relate to many species not before known.

KUNDMAN,

a great collector of natural curiosities, is placed by De Bergen among the systematical writers; but his "*Promptuarium*" has the arrangement rather of a catalogue than of a scientific treatise, and it seems to be founded upon Buonanni's rather than to be a system of his own. There is a paper of this collector in the *Act. Acad.*

Acad. Nat. Cur. on monstrous shells, and species that fetched a high price at that period.

Among the *Observationes Rariorum Med. Anat. et Chirurg.* of

STALPART

is a dissertation entitled "*Conchæ falsis gravidæ Anseribus,*" which forms another refutation of the absurd notions once entertained respecting the origin of the Barnacle Geese, and is illustrated by a plate copied from Wormius. The figure is quoted by Linnæus, though evidently not original.

JOHN ERNEST HEBENSTREIT

seems to have been the first writer who thought an arrangement of the *Testacea* worthy of forming the subject of an academical dissertation. The author makes no fewer than eight classes, six of which comprehend the univalves, and two the bivalves. Attending, like most of his predecessors, by far too much to the innumerable variations of the general shape of shells, and by far too little to the apertures and hinges, he has multiplied the subdivisions of his system to a very unnecessary degree. He has also introduced an useless, if not an unphilosophical, distinction between *Testacea* and *Conchyliæ*.

The museum of Richter, a senator of Leipsic, was described by this author; but the method which he observed in that undertaking seems to have been compounded of Aristotle's, Lister's, and Rumphius's, conjoined with his own.

DALE

(the well known author of the *Pharmacologia*) has inserted in his edition of Taylor's *History of Harwich* an account of the *Testacea* found in the country and on the sea-coast about that town. This
account

account is arranged agreeably to the system, and for the most part in the words, of Lister, but not without synonyms of preceding authors and many remarks of his own. As the figures of the Harwich fossils are so numerous and so accurate, it is much to be lamented that the recent shells were not included among the engravings.

BREYNIUS

was another author who formed a systematic arrangement of shells. His "*Dissertatio Physica de Polythalamis*" derives its principal merit from the more precise specification of the *Belemnita*, *Ammonita*, and *Orthoceratita* than had hitherto appeared. There are seven good plates of *Echini* accompanying this work. Breynius was author also of a Latin epistle to Sir Hans Sloane on the plants and animals of Spain, which appears in the *Philosophical Transactions*, and which contains a description (with figures) of *Helix Janthina*, mentioned by this author as "*Cochlea colore speciosior.*" There is another epistle, (viz. "*De quibusdam Conchis minus notis,*") in the *Mém. sopra la Fisica e Istoria Naturale*.

VALLISNERI,

the celebrated Italian physiologist, whose pursuits were so similar to those of Reaumur, did not, any more than the latter, disdain paying attention to testaceous animals. In his *Opere Physico-mediche* we find two dissertations; one relative to the *Teredo navalis*, and another on the subject of some *Chitons*. The *Teredo navalis* gave rise to numerous essays about this time, more especially in Holland and Germany. The former of these countries had peculiar reason to feel an interest in the history of that destructive creature. In the year 1730, the persons appointed to take care of the dykes observed that the piles (which were made of the hardest oak) defending the low countries from the incursions

sions of the sea, were eaten through in a few months. The damage occasioned by so extraordinary a corrosion of the timber was immense, and the people of Holland were thrown into the utmost consternation. Luckily, however, adequate remedies were ultimately discovered; and it was by the accounts which came from the pens of Rousset, Putoneus, Belkmeer, Massuet, but more particularly

SELLIUS,

that naturalists now had an opportunity of learning very fully the history of the *Teredo*. The work of Sellius is entitled "*Historia Naturalis Teredinis, seu Xylophagi Marini*." It is illustrated by two plates, and contains much learning, as well as curious detail of facts relative to the structure and habits of the animal.

The following year

FISCHER,

of Konisberg, published a synoptical table of shells, which is contained in the work of Klein on *Echini*. It is divided into three parts, *Cochleæ*, *Conchæ*, and *Polyconchæ*, each of these being subdivided into classes and *genera*. The names of most of the latter have been retained by Linnæus to designate his species; but, in fact, they have been in pretty general use from the time of Rumphius.

The 2d edition of the *Bibliothecæ Appendix* of

BYTEMEISTER

contains two plates of shells (viz. 11. and 12.), which are executed with great accuracy. It is to be lamented that they are not accompanied by some description.

In a work published by

DESLANDES

are two dissertations; one on the subject of Barnacles, and the other "*sur les Vers qui rongent le Bois des Vaisseaux*." From the na-

ture of the facts of which they treat, it cannot be supposed that they contain much original matter, those species of *Testacea* having been amply described before.

The "*Catalogue raisonné*" published by a dealer at Paris of the name of

GERSAINT

would scarcely deserve mention here, were it not prefaced by some general observations on shells, an account of the principal cabinets then existing in France and Holland, and a list of such authors and their works as are most worthy of being consulted: these particulars are interesting to collectors, and render the book useful for reference; though it is very defective in the enumeration of testaceological writers, and is more suited to the lover of mere curiosities than to the man of science.

DUHAMEL,

the well-known French botanist, ought to be mentioned among our authors, having published some experiments on the colouring matter furnished by the *Purpura*, with remarks on the species itself. These are inserted in the *Mem. de l'Acad. Royale des Sciences* for 1736. Duhamel considers the purple fish of the antients as a species of *Murex*; whereas his countryman Reaumur supposed it to be the *Buccinum Lapillus* of Linnæus.

It will be proper to place here

SWAMMERDAM;

since it was in 1737 that his *Biblia Naturæ* first appeared, a work containing many valuable anatomical remarks on testaceous as well as other animals, which are illustrated by figures. From the catalogue of this great physiologist's museum, published in 1679, it appears that he was an indefatigable collector of most kinds

kinds of natural curiosities, shells forming no inconsiderable part of the cabinet. Though the works now alluded to came forth in Dutch and Latin, yet the *Biblia Naturæ* soon assumed an English dress; and its latest edition by Hill, containing the translation made by Floyd and notes copied from Reaumur, was a very acceptable addition to the libraries of our countrymen.

PLANCUS,

of Arimini, published a curious book on shells found on the shores of the Adriatic, with an account of the tides in that sea: there are descriptions in it also of several marine productions besides *Testacea*, which, with the latter, are figured in five plates. Some of the species so nearly resemble the *Cornua Ammonis*, both internally and externally, that the author might almost have been warranted in asserting the existence of recent specimens of those remarkable shells, so frequent in the fossilized state. The first edition of Plancus's work, "*de Conchis minus notis*," was printed at Venice in 1739; the second at Rome in 1760, with nineteen more plates than appeared in the former, which contained only five; and in these five some additional figures are inserted.

In the year 1742 appeared the splendid and valuable work of

GUALTIERI,

entitled "*Index Testarum Conchyliorum quæ adservantur in Musæo Nicolai Gualtieri, Philosophi et Medici Florentini*," &c. The author, in his preface, gives some account of the books that had been published before his time; he also exhibits a system composed by 'TOURNEFORT', whose manuscripts on this subject had been presented to Gualtieri by Professor Targioni. The curious reader cannot fail to be interested in whatever came from the pen of one

of the greatest naturalists the world has known, and will find that this composition (which had not before made its appearance in print) deserves to have had a place among the most important of his works. Besides the great number of new and expressive terms which were introduced into Testaceology, the *genera* constructed by Tournefort exhibit infinitely more science and precision than those of any preceding writer in the same branch. His classes are analogous to those which had begun to be in general use, namely, *Univalvia*, *Bivalvia*, and *Multivalvia*; but this author preferred the terms *Monotoma*, *Ditoma*, and *Polytoma*. The classes are divided into *familia*, the characters of which are drawn chiefly from the general habit and contour; whereas those of the *genera* are founded in a great measure on the mouth or hinge, according as the shell is simple or valved. Besides Tournefort's system, our author gives a specimen of that of Breynius; but he adheres to Langius's, with the exception of the class *Polytoma*, borrowed from the first-mentioned writer. In the 110 plates which accompany Gualtieri's work are given figures of the most rare shells of the Asiatic and African shores; several of which were very indifferently engraved by Buonanni and other authors, and many (especially of the *Coni*, *Helices*, and *Nerita*,) do not appear to have been engraved before. It must be remarked, however, that many of the subjects from which the drawings were made appear to have suffered from the polish of the dealer, and the outline is not always given with scrupulous fidelity: yet, upon the whole, the *Index Testarum* of Gualtieri is an useful and magnificent work, and deserves a place among those which are most worthy of being consulted and referred to. As this did honour to Italy, so, in the same year, did that of

D'ARGEN-

D'ARGENVILLE

to the kingdom of France. The modesty of this author induced him to conceal his name in the first edition, the title page intimating only that he was of the Royal Academy of Sciences at Montpellier: it was inscribed "*L'Histoire Naturelle éclaircie dans deux de ses Parties principales, la Lithologie et la Conchyliologie,*" &c. In the first chapter of the first part some account is given of natural history in general, and of the works of those writers who have treated of Lithology and Testaceology. The catalogue is short, and the author declines speaking of his contemporaries, and of such as have given the natural history of particular countries only. In the second chapter of the second part he proceeds to develop his system, dividing *Testacea* into the three commonly received classes, and separating those species which inhabit the sea from those which inhabit the land. His families are twenty-seven in number, including the *Echini*, and are founded chiefly on external figure, though in the *genera* of *Pholas*, *Solen*, *Chama*, *Venus*, *Ostrea*, *Cypræa*, *Conus*, *Nautilus*, *Strombus*, *Trochus*, *Helix*, *Nerita*, *Dentalium*, *Haliotis*, and *Patella*, the characters correspond very nearly with those established afterwards by Linnaeus. Of thirty-three plates, twenty-six exhibit many of the more common as well as of the more beautiful shells; they are not only finely but accurately executed, and entitle our author to the epithet of "*nitidissimus*," so appropriately bestowed on him by the great Swedish naturalist. We ought not to omit mentioning that, besides a particular description of every species, the work contains a chapter on the formation and growth of *Testacea*, some observations on the methods of cleaning and polishing shells, and a concise account of the most celebrated cabinets of natural curiosities existing in Europe at that time.

The

The second edition of D'Argenville was augmented by a history of the *Mollusca* inhabitants of shells, and three new plates, two of which are illustrative of those animals; and the latter are figured, in general, of their natural size.

In 1780 there was another publication of this admirable work, with considerable additions, corrections, and improvements, by Messrs. Favanne de Montcervelle (father and son). There are upwards of 2000 shells figured in this edition, and in so masterly a manner that the work, on the whole, surpasses every thing of the kind which the world had seen before, and must still be held in the highest estimation by the lovers of testaceology.

BARTRAM

appears in the *Philosophical Transactions* as author of some "Observations concerning the Salt-marsh Muscle, the Oyster-banks, and the Fresh-water Muscle of Pennsylvania." These observations are accompanied by figures.

NEEDHAM,

whose account of *Microscopical Discoveries* is well known in our own country, deserves mention here, as having given a very full description of the *Lepas anatifera*, with figures of that shell and of various parts of the contained animal, which are referred to by Linnaeus.

At this period the "*Testacco-Theologia*" of

LESSERS

was written, with a view to elevate the study of those beautiful and varied creatures that inhabit the depths of the ocean to a level with others more commonly chosen for demonstrating the power and wisdom of the divine Ruler of the universe; and
surely

surely there are few tribes of animals which, by delighting the eye and engaging the attention, seem more likely to dispose the mind to sublime meditations, and to form a never-failing source of wonder and admiration, than the testaceous inhabitants of the deep. The title of this work might give rise to the supposition that it is calculated solely for popular use, and that the information is of that general and discursive kind which becomes subservient only to the exercises of piety; but it will be found to be no less suited to the study of the man of science. It contains a more full account of testaceological writers than occurs in most other treatises of this nature; it abounds with anatomical and physiological knowledge; the descriptions are conformable to a scientific arrangement of species; and by the notes and synonyms the author discovers himself to have been conversant with all the best productions of his predecessors in this department of natural history. It is also embellished with 137 figures of shells, which, though somewhat roughly engraved, are not unworthy of being consulted. A second edition was printed in 1756, preserving the octavo form like the first; it is only to be lamented that it did not undergo conversion from the German into some more current language.

At this period the natural history of our sister kingdom began to be investigated by men well qualified to do full justice to the subject. The first of these who committed his researches to the press was

DR. CHARLES SMITH:

but this gentleman limited them to the counties of Waterford, Cork, and Kerry, which counties he described successively, and in separate works, under the patronage and with the assistance of the Physico-Historical Society of Dublin. It may not be superfluous to remark, that the express purpose of this institution

was

was to cultivate the natural history of Ireland, and that it owed its origin probably to the plan originally formed by Mr. Boyle in England, which led to the labours of Plot and other county historians, and which cannot be sufficiently applauded for its utility. On the subject of *Testacea* Dr. Smith was not very minute or methodical: but the more common and well known species he is far from having, in all instances, treated of superficially.

DR. JAMES PARSONS

described two species of *Testacea* in the *Philosophical Transactions*: but they form the subjects of separate communications; the first of which, relating to *Mytilus lithophagus*, occurs in vol. 45, and the second an account of *Pholas pusilla*, called by this writer *P. conoides*, in vol. 55. The latter is illustrated by four figures.

The "*History of Animals*" of Doctor (afterwards

SIR) JOHN HILL

contains five good and correct plates of *Testacea*, each figure having its English name underneath. This author divided shells into a certain number of "*series*," the characters of which are founded on very dissimilar principles, some of them being derived from the nature of the shells themselves, and others from their habitations, like the divisions adopted by Lister. The *genera*, however, have some resemblance to those of the Linnæan system. The specific descriptions are in Latin, but the other parts of the work in English.

In the *Recueil de l'Académie de Rochelle* is a full description by

MERCIER DU PATY

of *Mytilus edulis*, to which the author has annexed three plates.

KLEIN.

KLEIN.

The first work published by this author which it falls within our province to notice is his "*Descriptiones Tubulorum Marinorum*," containing nine plates, which represent chiefly different species of *Belemnitæ*; but he notices also various species of recent *Testacea*, as *Solenes*, *Dentalia*, &c. in order to complete his arrangement of the tubular coverings of animals. But the principal testaceological performance of this author was his "*Tentamen Methodi Ostracologicae*," a work (as its title implies) written professedly with views to the establishment of a system, but which, though the composition of a very able naturalist, certainly does not possess the merit of practical utility. The general divisions (forming *parts*, *sections*, *classes*, and *genera*) are too numerous, and, what is worse, species are constituted in some instances without being referable to any genus; and in one of the *parts* there is a solitary genus without any class. The specific descriptions, however, are for the most part sufficiently full and precise, and there are frequent references to Aldrovandus, Gesner, Buonanni, Lister, and Rumphius. The work contains twelve plates; the figures are one hundred in number, but exhibit a harshness which is not compensated by any extraordinary correctness, and most of them are copies. A subjoined dissertation, "*De Formatione, Cremento et Coloribus Testarum*," deserves to be considered as the best part of the volume, for it contains many physiological remarks of an original and curious nature. This subject, though taken up by so early an author as Buonanni, had not hitherto been entered into so much as the nature of it demanded.—Klein wrote also on the *Lepas anatifera*, in the Memoirs of the Nat. Hist. Society of Dantzic.

JO. HENR. COHAUSEN

was the author of a "*Conspectus Sciographicus Testaceorum.*" There cannot, however, be a more strange and unscientific arrangement of shells than the one here proposed; nor can it answer the purpose of any person to whom the descriptions of Pliny, Buonanni, and Rumphius are familiar, to consult it.

A considerable work on shells was published in the year 1755. The author,

NICHOLAS GEVE,

does not give any scientific names, nor is his description of much use to a scientific reader; though there are some good references in the notes. He employs both the German and the French languages, and is very diffuse. The plates are the most valuable part of the work, being thirty-three in number, and containing 434 coloured figures, which are in general correct.

DR. WHYTT

was author of a description of the ovary of the *Buccinum ampullatum*. This description is accompanied by figures.

Two memoirs on the subject of *Testacea* were laid before the French Academy by

GUETTARD,

well known by various other interesting tracts on different branches of natural history. The first of these memoirs is entitled "*Observations qui peuvent servir à former quelques Caractères de Coquillages.*" Fourteen *genera* are here described, founded on the nature of the contained animals. The second memoir is "*sur le Rapport qu'il y a entre les Coraux et les Tuyaux Marins, et entre ceux-ci et les Coquilles.*" To this are annexed five excellent plates
of

of *Serpulæ*, *Dentalia*, &c. In the general collection of his works we find a description of the *Sable coquillier*, or shelly sand found at Zalbach, near Calais (tom. 2. p. 21—22.); also a long dissertation on tubular substances found in the sea, which is accompanied by a scheme of arrangement.—The last of this author's memoirs which it falls within our province to mention is on the subject of *Lepas anatifera*. The history of this animal is very diffusely given in the 4th volume of the collection. M. Guettard remarks upon the accounts given by authors from the earliest times, tracing out the origin of the fabulous narratives that were copied from one to another respecting that singular species.

In the Transactions of the Electoral Academy of Mentz, the only writer who has treated of shells is

JOHN FREDERIC HOFFMAN.

Two of his communications relate to species resembling the *Cornu Ammonis*, which, in fact, he describes as being found in a native state; but, though a *Nautilus*, the shell he alludes to cannot properly be considered as being the same with that fossil. The "*Tubuli vermiculares Cornua Ammonis referentes*" (described in p. 16—20.) are minute shells, similar, many of them, to what had been before noticed by Plancus. The 2d volume of these Transactions contains a paper from the same author descriptive of *Helix auricularia*, the animal of which species, as well as the shell, is minutely noticed.

COUNT JOSEPH GINANNI,

of Ravenna, rendered himself well known to the lovers of Testaceology by two considerable works which treat of that subject very largely. The *Opere Postume* contains a description of the maritime, marsh, and terrestrial *Testacea* of the territory of Ravenna,

after a system somewhat similar to Buonanni's, and in the Italian language. These different tribes are distributed into three correspondent treatises, the first of which is accompanied by thirty-one plates, the second by four, and the third by three only. The engraving is slight; but there is a correctness of design in most of the figures, and several new species are contained among them. A like character may be given of those which accompany the other work, descriptive of the museum formed by his uncle Count Francis Ginanni, for which he had prepared most of the materials, though its publication did not take place until five years after the former. It is illustrated by two plates of *Testacea*, which, under the head of "*Corpi che stanno in Mari*," are described agreeably to the system contained in the *Opere Postume*. There are pretty numerous references to preceding writers, which considerably assist readers unacquainted with the Italian language.

In the same year with the re-publication of the fine work of D'Argenville, the French had to boast of another author of their nation rendering singular service to the study of the *Testacea*; this was

ADANSON,

who, in his "*Histoire Naturelle du Senegal*," has presented us with an accurate description of shells figured in sixteen plates. It is prefaced by an account of the author's travels in the years 1749, 1750, 1751, 1752, and 1753. There is also a general history of Testaceology, and an arrangement of species invented by himself. This arrangement rests principally on circumstances connected with the structure and habits of the animals; on which subject Adanson is more diffuse and particular than almost any person who preceded him. His general divisions of *Testacea* are *Limaçons* and *Conques*; the first of these comprehending his *Univalves* and *Operculées*, the second *Bivalves* and *Multivalves*. His species are only 185
in

in number ; but under each of these are arranged numerous *varieties* (as they are considered by this author), which, however, have most of them been constituted distinct *species* in other Testaceological works. These are illustrated by 400 figures, which have in general the merit of correctness, but are not so elaborately and strongly engraved as might be expected in a French performance of that period, when, in this highly useful and elegant art, France was not rivalled by any other nation in the world.

There is a paper by this author in the *Mem. de l'Acad.* descriptive of a species of *Pholas* which he observed in the timber of ships in Senegal, and illustrated by very good figures of *Teredo navalis* and the *Pholades*.

In 1758 appeared the long expected third volume of the "*Descriptio Thesauri Rerum Naturalium*" of

SEBA,

containing sixty-one plates of shells, some of which, however, may be considered as useless, since they represent figures of birds, &c. formed from those shells ; and most of them discover great waste of engraving. There is still another subject of regret which must occur to every person who peruses this sumptuous and bulky work, namely, that most of the figures are common and well known species, and calculated more for the amusement of the eye, and for the surprise of the ignorant, than for the assistance of a scientific naturalist. The descriptive part is not remarkable for precision, nor is there any appearance of regular system. One very useful purpose, however, may be said to have been answered by the repeated representations of the same species given by Seba, which is the possibility of seeing it in various positions : the student being thus enabled to determine the agreement of his specimen with those which are figured, more certainly

tainly than when he is presented with only one view of a shell. This advantage seems to have been particularly attended to by Gualtieri, who may be considered as having given excellent hints to ichniographers; for his figures are no where unnecessarily multiplied (which is more than can be said in praise of Seba), and they have an obvious connexion with the more satisfactory determination of species. It is much to be lamented that in many other works, which (except in this particular) are of high value, his judicious example has been wholly overlooked.

BORLASE,

the indefatigable historian of *Cornwall*, is to be applauded for giving a pretty copious catalogue of the shells found in that county, which, from the position and extent of the shores, are very numerous. His 28th plate contains nearly thirty figures of *Testacea*, and they are very correct. The author displays but little science in this branch of natural history, and his descriptions are copied from some of the oldest writers on the subject.

There are some good figures, accompanied by descriptions, of several species of *Lepas*, in the *Philosophical Transactions*. The author of this description was

JOHN ELLIS,

well known by his elaborate work on *Corallines*; he addresses it in a letter to Mr. Isaac Romilly.

The figures of shells in

EDWARDS

are referred to in the *Systema Naturæ*; but they are very few in number, and occupy only a secondary place in this author's "*Gleanings*."

We

We now come to the proper place for adverting to what was effected in the science of Testaceology by the immortal

LINNÆUS.

From *his* great and comprehensive genius, this, like the other branches of natural history, was destined to receive an entirely new aspect: under his reforming hand it passed from confusion and incongruity to lucid order and simplicity; and though the improvement, as happens with all the most useful results of human labour, was, even under his pen, progressive, it reached a precision and facility of application to which former systems can scarcely be said to have approached.

There has been a very general belief that less attention was devoted by Linnæus to the history and arrangement of the *Testacea* than to any other order of the animal kingdom, and that he even thought their external coverings, or shells, scarcely worthy of becoming subjects of scientific distribution. Whatever may have been the origin of this belief, it certainly does not appear to us to be warranted by any examination of the *Systema Naturæ* itself, not even of its earliest editions. The original state of that extraordinary work (and it was in this that Linnæus first touched on Testaceology) did not indicate, perhaps, less happy reformation of method with regard to the *Testacea* than to other parts of organized nature; its deficiencies were those from which few other portions of the performance were exempt, and which were naturally to be expected in all, on the first sketch of so grand and so heterogencous a subject. The great aim of the author being simplicity, he seems to have at first over-reached it rather than to have fallen short, and the consequences are obvious. His original *genera* of shells were too few, being only eight in number, viz.

1. *Cochlea*.

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|----------------------|-----------------------|
| 1. <i>Cochlea</i> . | 5. <i>Patella</i> . |
| 2. <i>Nautilus</i> . | 6. <i>Dentalium</i> . |
| 3. <i>Cypræa</i> . | 7. <i>Concha</i> . |
| 4. <i>Haliotis</i> . | 8. <i>Lepas</i> . |

In some of the subsequent editions of the *Systema* two or three more *genera* were added; but, at length, in the 10th they were augmented to thirty-two, which are only three less than Linnæus employed on any occasion afterwards. The edition of 1758 is, therefore, to be considered as the period at which he may be said to have perfected his principles of Testaceological arrangement, though, in fact, the principles themselves underwent no material change from the beginning, (a proof that our illustrious author never treated the subject with carelessness,) the only alteration that he deemed necessary being in the number of the *genera*: he accordingly broke that of *Cochlea* into *Conus*, *Bulla*, *Voluta*, *Buccinum*, *Strombus*, *Murex*, *Trochus*, *Turbo*, *Helix*, and *Nerita*, and that of *Concha* into *Chiton*, *Pholas*, and the *bivalvia*. The faults of the Testaceological systems which preceded Linnæus's may be readily deduced from the remarks made in various parts of this paper. These systems laboured under extreme difficulty of application, not only on account of the multitude of divisions and subdivisions which were deemed necessary by their respective authors, but also of the practice of founding generic distinctions on variations of general *contour*. Such variations being endless, there was consequently no end to the multiplication of families, and *species* became correspondently sparing. There was only one author who can be said to be free from reproach on this score, and that was Adanson: he, however, set out upon principles of arrangement essentially different from those of the generality of writers on this science, and, by making the contained animal almost exclusively the basis of his system, necessarily became limited

limited in the choice of generic characters. But to the establishment of characters purely zoological the objections are still stronger than to the being guided by the general form of the shell. Independently of the very small extent to which our knowledge of the *Mollusca* has hitherto been carried, it appears to us that, from the very nature of these animals when provided with a portable place of retreat from danger, they can never present those permanent and obvious points of distinction so indispensable to an apt and commodious investigation of all natural objects. Wherein does the animal differ from an unshapen mass of lifeless matter when coiled up within its shelly habitation? And how are its natural shape and appendages to be examined, but by the knife of an anatomist? In fact, it is reasonable to conclude that innumerable testaceous animals must ever remain unknown to us, except by the *exuvie* accidentally thrown upon the shores after their death: many of them appear to inhabit inaccessible recesses of the ocean, and others part with life on the point of being removed from their native element. To place his system beyond the reach of those objections which presented themselves to all that had been hitherto proposed, Linnæus was obliged to strike out some principles of discrimination wholly different from any before exemplified; and that sagacity with which he seized new and admirable guidances to methodical arrangement, in other parts of the dominions of nature, fortunately assisted him also in this. After having convinced himself of the futility of forming a system of Testaceology solely on the structure of the animal, or even making the latter at all concerned in the *specific* distinctions, he astonishingly simplified the whole science by dividing *Testacea* only into the three obvious families of Univalves, Bivalves, and Multivalves, with subordinate *genera* characterized by variations of particular *parts* of the shells. The hinge in bi-

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valves, and the aperture, or mouth, of univalves, as it was a permanent character, so was it also less multiform than any other that could have been chosen. The general outline, however, was not wholly neglected. It served to form an uniting character for such as may be called natural families of shells, which were distributed into suitable divisions, subordinately to the artificial *genus*, so as to become an assistance instead of an embarrassment in the investigation of species. Thus, the terms *truncati*, *pyri-formes*, *elongati*, and *laxi*, became useful demarcations in the genus *Conus*, without creating the confusion which must always be incident to too great a number of regular *genera*, especially when those *genera* are formed (as was the practice of the generality of preceding authors) from external figure only. In a few *genera* it was necessary to deviate a little from these principles, (and what system can be free from anomalies?) yet they are too few to affect the general simplicity, and we ought to be surprised only at the characters holding good so far as they do. But our great author was not wholly inattentive to the creatures for which the beautiful and endlessly diversified receptacles that he had characterized were designed. Among the generic marks was included the name of the molluscous inhabitant; or, where the animal differed from any which had a place in other parts of his system, he described it at length. Thus was a method established, which, though not speculatively regular, possesses so much practical utility that we cannot hesitate to prefer it to any hitherto made known to the world. Whatever improvements it may undergo (and of improvements all human systems must necessarily be susceptible), there is in our minds no doubt that the general foundations will stand the test of scientific application for ages; a sentiment which will appear the less bold, if we quote in aid of our assertions those of a very distinguished naturalist of a neighbouring

bouring country; in which if, after almost unprecedented pains had been taken, both by himself and by an indefatigable contemporary, for the formation of a perfect system, the principles of Linnæus remain unimpaired, we may fairly relinquish the expectation of being presented with any less exceptionable. "On peut dire," says M. Lamarck, "que Linné a établi les vrais principes qu'on doit suivre dans l'étude et la détermination des coquilles, et qu'il a posé les bases de cette intéressante partie de nos connoissances." (*Mem. de la Soc. d'Hist. Nat. p. 63.*)

Having made these general remarks on the Testaceological part of Linnæus's *Systema*; we shall proceed to notice such other of his works as relate to this branch of natural history. The first of these in order of time (and certainly not the last in point of value) was the *Fauna Suecica*, originally published in 1746, and containing sixty species of *Testacea* admirably described, with their synonyms at full length. In the second edition, which came forth in 1761, the number of species discovered to be natives of Sweden was augmented to eighty-nine, and the *genera* exhibited the improvements adopted in the 10th edition of the *Systema*. But, prior to the appearance of the improved *Fauna Suecica*, the author had described the cabinets of the king of Sweden and count Tessin, the contents of which had, no doubt, furnished him with new hints towards perfecting his method in every branch of natural history. It is to be lamented, however, that neither the *Museum Tessinianum* nor the *Museum Adolphi Friderici Regis* contain descriptions or figures of more than three species of *Testacea*. They are works of much splendour, in point both of typography and engraving, but afford very little assistance to the helminthologist. In the description of another *Museum* (that of the queen of Sweden) Linnæus made ample amends for his brevity in that of the former; and her Swedish majesty's collection being

particularly rich in insects and shells, he was enabled to afford abundant information to the lovers of both these orders of the animal kingdom. The *Museum Ludovicæ Ulricæ Reginae* may be considered as the best of Linnæus's Testaceological works, and, as it is so frequently quoted in the *Systema*, becomes, though now very scarce in this country, of indispensable utility to the scientific student. It describes 434 species of shells, and the remarks subjoined to the definitions of each are admirable for their precision, minuteness, and regularity. This volume was published in 1764; but, though posterior in date to that of the 10th edition of the *Syst. Nat.*, it retains the old divisions of *Conchæ* and *Cochleæ*. The last of Linnæus's works, viz. the *Mantissa altera*, contains thirty-five species not described in any of the books already mentioned.—It ought to have been remarked in an earlier part of this account, that our great author's Travels contain descriptions of several species of *Testacea* at considerable length; but, from the language in which these were written, they are of little use to the English reader. The *Iter Westro-gothicum* contains one plate of shells, which, however, represents the univalves reversed, as if they were all heterostrophous.

In regard to the terms and peculiar descriptive manner adopted by Linnæus in this part of his labours, they are no less surprising for their happy expressiveness, appropriateness, and utility of application, than in other departments of the science of nature, to which he gave the same new aspect and stability of reformation. They constitute a language of his own,—a language so eminently subservient to the purposes for which it was calculated, that it would alone be sufficient to mark the superior genius of Linnæus. At the same time we cannot hesitate to confess, that a few of these terms, however strongly they may be warranted by the similitudes and analogies which they express, and which when so
pointed

pointed out are of great advantage to the language of science, are not altogether reconcilable with the delicacy proper to be observed in ordinary discourse; nor are they such, perhaps, as should be employed on any occasions, except those when their original signification is immediately implicated. Yet these terms may be exchanged for others without detriment to the Linnæan phraseology in general; and though none probably more expressive can be adopted for the respective purposes, they may be abolished without any great disadvantage to those generic definitions into which they have been introduced.

Whilst alluding to the language and terms employed by Linnæus in his description of the *Testacea*, we ought to refer the reader to the *Fundamenta Testaceologiæ*, in which they are all scientifically explained, and which contains a complete illustration of the principles of arrangement adopted in this part of his works. Though it bears the name of MURRAY, who was respondent in this academical dissertation, the performance ought properly to be considered as the President's, who, as in all the other papers contained in the *Amanitates Academicæ*, furnished the principal materials for them himself. The paper of which we are speaking contains three plates, explanatory of the generic characters, and of the parts of shells to which the several terms apply.

In concluding our remarks on the works of Linnæus, we ought to take some notice of the editor of his *Systema*, GMELIN, who has increased the number of the *Vermes Testacea* to 2334. If the whole of this number were founded on unimpeachable authorities, and if the writer had in other respects inspired confidence in his correctness, as well as in his knowledge of the subject, great indeed would have been the obligation of naturalists to this laborious publisher. Unfortunately, however, his errors are innumerable

rable in this part of the *Systema*, with which he seems to have been less conversant than with any other; and so little dependence is there on his references and synonyms, that the same figure is frequently found to be quoted for species most widely different from one another; and even the same species, in more than one instance, is described twice. A writer who should undertake to rectify these errors would perform a truly valuable service to Testaceology. Such an opportunity presented itself to a countryman of ours, who has recently put the *Syst. Nat.* into an English dress, and who has professed having availed himself of the improvements and additions of later naturalists; yet we cannot find that DR. TURTON has done more than having trodden in the steps of Gmelin, not perceiving even the most glaring of his inadvertencies. It would be wholly useless and superfluous, therefore, to assign any place to the English editor of Linnæus's *Systema* but that of a mere translator.

The remark we have made relative to the comparatively small number of rare species figured by Seba is applicable also to the superb and costly work of

REGENFUS,

which, though it reflects honour on the artist and on the monarch by whom he was patronized, has conferred but little benefit on Testaceology as a science. It contains twelve beautifully coloured plates, in imperial folio, each plate comprehending twelve shells. The descriptive part (which is in both French and Danish, and was the work of Professor Kratzenstein and Dr. Ascanius,) is preceded by a full list of authors, and by an account of the principal cabinets of shells at that time existing in Denmark. Fronting each plate is a good table of synonyms, which may be considered as one of the most useful parts of the work; but the species

cies to which they refer are in general of the most common kind. We cannot but lament that the hand of so admirable an engraver was not employed on subjects which more strongly needed the assistance of his art in order to be known; for those which are figured by Regenfus fall daily under the notice of the most humble collectors. Had this work been continued, however, it is probable that there would not have been so much ground for regret. Among the plates intended for a second volume (impressions of twelve of which are possessed by Sir Joseph Banks) the species figured are much more interesting than in the first; several of these are described by Dr. Martini (*Berlin. Sammlung* 6. *Band.* p. 667—669.); but it is to be feared that, as the original artist is now no more, the intention of editing them has been relinquished.

The “*Opuscula Subseciva*” of

BASTER

contain much anatomical and physiological matter of a very curious nature, relative to testaceous as well as to crustaceous and molluscos animals. They were continued from the year 1759 to 1765, forming six distinct books, each illustrated by very instructive and interesting engravings. The propagation and *ovaria* of shell fish in general; the *Ostrea*, *Mytili*, *Pholades*, and *Tellinæ*; and several species of *Testacea* individually, are amply and satisfactorily treated of; in short, to those who are more studious to ascertain facts in the œconomy, structure, and habits of animals than to store their memories merely with the names of *genera* and *species*, the works of Baster may be recommended, as containing a fund of important and original information.

There is a translation of this author's dissertation on the *Teredo navalis* in the *Philosophical Transactions*, and it is accompanied by figures.

An

An excellent *Monographia* of the *Helix decollata* was published by

BRISSON,

whose observations are illustrated by thirteen figures, and they relate to the structure of the animal as well as to the shape of the shell.

DR. FORBES

gives, in the *Philosophical Transactions*, an account (which, however, is much too concise) of a *Patella* found at Bermuda. The figure, as it exhibits only the structure of the animal, makes but imperfect amends for the deficiency of description; and though a short addition is made to the latter by Dr. Morton, the species is far from being defined.

In 1760,

KNORR,

a painter of Nuremberg, began the publication of a work entitled "*Les Délices des Yeux et de l'Esprit.*" He did not live to complete it himself; but the task was carried on by his executors, who concluded it with a sixth part, published in 1773. This last part contains forty plates of shells; each of the five former was limited to thirty. There are, in the whole, 978 figures, very slightly engraved, but well drawn and most elegantly painted. No order is observed; and many subjects are repeated, on account of slight variations in the colour and contour. The last ten plates present white shells on a dark-coloured ground. With the second part a systematical table is given; but this is connected only with the plates preceding, and very nearly agrees with that adopted by Rumphius, of which, in the present improved state of science, the reader will be content to take only a transient notice. The descriptions of the plates relate chiefly to the figure and colour of the objects represented, containing but few remarks concerning

concerning their natural history. A Linnean table is subjoined by the editors; this is too inaccurate, however, to be of use to a scientific student.

But the above was not the only Testaceological work, materials for which were compiled by this industrious and able artist. His "*Delicia Naturæ selectæ*" contain seven finely coloured plates of shells, with copious descriptions in French and German, intended for popular use. This volume came forth under the direction of Muller and de la Blaquière, the original author having died prior to the time of its publication; but his name cannot fail to be remembered with respect by those who devote themselves to his favourite pursuit, from the reflection that the *useful* parts of these elegant performances originated entirely with himself.

In this place it will be proper to notice a compendious view of various systems of Testaceology written by

DE BERGEN,

and printed at Nuremberg in 1760. It exhibits the systems of twenty-four different authors, under the heads of "*Methodi universales*" and "*Methodi particulares*," with concise strictures on each system separately. This work originally appeared in the *Nov. Act. Ac. Nat. Cur.*

The *Acta Helvetica* contain two Testaceological papers from the pen of

SCHLOTTERBECCIUS;

one entitled "*Observationes de Cochlea quadam ad Turbines referenda*," and the other "*Observatio Physica de Cochleis quibusdam nec non de Turbinibus nonnullis*," &c. The very titles indicate the desultoriness of these descriptions; and the figures accompanying them do not supply their imperfections, except indeed some which are illustrative of the paper last mentioned, and which re-

late chiefly to fresh-water and land species of the genera *Turbo* and *Helix*. It is impossible to discover what species of shell is the subject of the first paper.

In the same work, and in the same volume with Schlotterbeck's first paper, we find some account of the *Turbo Nautilus*, by

HOFER.

This account relates chiefly to the animal, considered separately from the shell, and is illustrated by figures.

The *Comment. Acad. Sc. Imp. Petrop.* contain three papers communicated by

KOELREUTER,

who, in the first of these, has described a species of *Serpula* (found in the White Sea), which he calls *tubipora*, but which is the *filograna* of other writers. The second paper describes *Sabella scabra*, called by this author a *Dentalium*. *Sabella scabra* may be considered as a giant among the *Testacea*, the specimen described by Koelreuter being 4 feet 2 Paris inches long, and 3 lines in diameter at one end, and 6 at the other. There is a figure accompanying the description in tom. 12. Our author's third paper is of a physiological nature, and relates to the *ovaria* of *Mytilus cygneus*.

The 1st and 2d volumes of the *Amusement Microscopique* of

LEDERMULLER

contain some good coloured figures of minute shells, of which it is only to be lamented that the author has not given a more scientific description.

The anatomy and physiology of the *Vermes* were, at this period, subjects of more general interest than ever. The progress of discovery

discovery had augmented the number of known species to a wonderful degree ; and from remarking the large portion of the chain of organized life occupied by these creatures, naturalists were necessarily led to turn their attention to facts as well as to names, and to presume that many curious and important analogies, illustrative of the phænomena of life and sensation, might be collected from an examination of the structure and habits of so extensively varied a tribe. In the *Mem. de l'Acad. des Sciences* (a work which we have so frequently had occasion to mention with respect, as a repository of information highly valuable to the Testaceologist) we find a paper entitled "*Eclaircissemens sur l'Organization jusqu'ici inconnue d'une Quantité considérable de Productions Animales, principalement de Coquilles des Animaux,*" by

HERISSANT,

who has subjoined to it eight excellent plates, three of which relate entirely to shells, and the other five to *Madreporæ*, &c. The matter is not wholly original; but, when we mention that it occupies upwards of thirty pages, it will naturally be imagined that the reader may derive advantage from its perusal: there are certainly many facts and speculations which have not less merit for their novelty than for the utility of their application.

The extensive collection of natural curiosities formed by

M. DAVILA

is described in three octavo volumes. The first of these relates to the Testaceological part of the collection, which is treated of pretty conformably to the Linnean system, but wholly in French, and divided into three distinct portions, viz. "*Coquilles de Mer, d'Eau douce, et terrestres.*" There are twenty-two excellent plates, containing several species never before figured, and in a great

measure compensating for imperfections in the descriptive part. It is a work that deserves to be more generally known than it seems hitherto to have been in this country; and as the figures are both original and accurate, they ought to be more commonly quoted.

Among the *Mem. Etrang. de l'Acad. des Sciences* we find an excellent account of *Mytilus lithophagus*, written by

FOUGEROUX.

This account is illustrated by a beautiful plate, which exhibits very accurately the *nidus*, shell, and structure of the animal.

The 9th volume of this same work contains a memoir by

DE LA FAILLE,

“*sur l'Origine des Macreuses*,” in which a full refutation is given of the strange story of the Barnacle Goose, and there is a large figure of the well-known shell originally supposed to produce it. This was a subject on which it was scarcely worth while for a writer of so late a period to employ any pains.

GEOFFROY

merits mention among writers on the *Testacea* for his “*Traité sommaire des Coquilles tant fluviatiles que terrestres qui se trouvent aux Environs de Paris*.” The number of species described is forty-six, which are included in seven *genera*; and the system is the author's own, though not materially different from that of Linnæus, except that more attention is paid to the animal itself than in the works of the latter. The specific descriptions are given in Latin, but the bulk of the work is in the French language. An artist of the name of DUCHESNE published three plates of Fresh-water and Land Shells, which form a good accompaniment to these descriptions

descriptions of Geoffroy; they contain figures of forty-six shells (with French names correspondent to Geoffroy's system), all found in the environs of Paris.

Many valuable experiments and observations, tending to throw light on the physiology and pathology of the Snail tribe, are to be found in the *Journal des Sçavans* for 1770. They were commenced in the year 1768 by

COTTE,

and continued in the *Journal de Physique*.

WALLIS,

the historian of *Northumberland*, includes the *Testacea* in his account of the natural productions of that county, adding copious synonyms from Lister, Petiver, and Linnæus; but the number of species described is only eight.

The commencement of the great conchological work of

MARTINI,

in the year 1769, may be considered as forming a sort of epoch in the history of that science, it being the most copious, laborious, and valuable publication on the subject of shells that has hitherto appeared. Only three volumes, however, were completed by this author; the other seven came from a Danish clergyman,

J. H. CHEMNITZ,

by whom the undertaking was concluded in 1788. The "*Neues Systematisches Conchylien Cabinet*" contains 366 plates, exhibiting no fewer than 3711 figures, besides vignettes, &c. which are all faithfully drawn, and coloured with the utmost accuracy. In the 9th volume are many South Sea species, which had never before been figured, and which were selected from some of the most celebrated

celebrated cabinets on the continent, but more especially from that of Spengler, whose collection deserves to be considered as one of the most extensive, as well as the most replete with rare and interesting specimens, that has ever been formed for the study of the *Testacea*. The name of SPENGLER ought to have a place also among the writers on these subjects, descriptions of several shells from his pen having appeared in different German publications; and it has not unmeritedly been attached, as a specific denomination, to a *Mactra* described by Chemnitz.

The work of which we are here particularly treating does not materially differ, as to system, from the Linnean school, but (excepting just the definitions of the species and the synonyms) is written wholly in the German language; and it is much to be lamented that it has not assumed any other dress, for the fulness of the descriptive part renders it highly worthy of being consulted. At the period when the use of the Latin language was thought indispensable in books of science, the attainment of knowledge was attended with much fewer difficulties than at present, when, though the use of a dead language may not be absolutely necessary, there is certainly as much need as ever of some one tongue being made the medium of communication among philosophical men of all nations. We do not hesitate to pronounce the volumes of Martini and Chemnitz as constituting a Testaceological library in themselves; and we cannot, therefore, adequately express our regret at their utility as books of reference being limited to the German scholar, when it might, without any considerable difficulty, have been extended to all lovers of the science by the substitution of French.

Chemnitz was author of several Testaceological papers inserted in different foreign journals, but they are not of sufficient importance to require being particularized. His collection of shells

is

is proved to have been very rich, by the catalogue of the sale lately published: of the number of the multivalves contained in it, we may judge from his remarks on that division published in the *Nova Act. Acad. Nat. Cur.* wherein he speaks of being possessed of no fewer than thirty different species of *Chiton*.

SCHRÖTER

may be considered as one of the most indefatigable Testacologists of later times. His treatises on land and river shells, and his introduction to the Linnean system of conchology, have laid his countrymen under great obligations to him, and have contributed in a very conspicuous degree to the general extension of the science. We shall proceed to specify the titles and time of publication of these highly useful works; after which we would, with a due tribute of praise to the author, detail such of his labours as are of less account, were they not too numerous to be noticed in a paper of this kind, and were not most of them scattered in a variety of German publications, to which recourse cannot very generally be had in this country. The "*Versuch einer systematischen Abhandlung uber die Erdkonchylien um Thangelstadt*" is illustrated by two copper-plates, containing figures of the land shells found chiefly in the neighbourhood of Thangelstadt. The next work was an account of the river shells of Thuringia. This excellent treatise contains eleven very correct engravings, which, however, are rather too highly coloured. There are long descriptions in it, with good specific characters, formed on the Linnean method. A third treatise came forth at Frankfort in 1783, under the title of "*Ueber den innern Bau der See und einiger ausländischen Erd und Fluss Schnecken*," with five plates. In the same year with the last-mentioned work this writer published his general conchology in three thick octavo volumes, illustrated

illustrated by nine good plates, and containing ample descriptions, with synonyms at length, of every known species of shell. The "*Einleitung in die Conchylienkenntniss nach Linné*" sets out with an explanation of the Linnean system of Testaceology, to which it forms an excellent introduction. The systematical part, however, inverts the order followed by Linnæus in his *Systema Naturæ*, as it begins with the Univalves and ends with the Multivalves.—Consistently with chronological detail, we ought to have mentioned in an earlier part of our notices of Schröter his republication of the plates of Gottwald's museum; yet this volume not being wholly original, though so acceptable a present to the lovers of Testaceology, might, without impropriety, perhaps, have been excluded from the regular enumeration of works more creditable to the author's reputation. Of forty-nine plates, forty-three relate entirely to shells which had been in a great degree described (though not in print) by the older Gottwald. The drawings also from which the figures were taken had been made by that collector. At the death of Dr. J. C. Gottwald the plates and MSS. fell into the hands of a bookseller, who (after they had undergone revision and received additions from the author of whom we have been treating) published them at Nuremberg in 1782. The museum itself was purchased by Peter the Great for 1000 rubles. We have before spoken of the correctness and elegance of the engravings, which cannot fail to immortalise the name of Gottwald; and his editor has imparted much additional value to the work by the subjoined letter-press.

RUTTY,

in his "Essay towards a Natural History of the County of Dublin," has followed pretty nearly the steps of his countryman Smith, referring to no scientific author on the subject of *Testacea*, excepting

cepting Lister, and his information is (on this subject at least) in no respect ample.

In the *Fundamenta Zoologica* of

BRUNNICH

we find a few *genera* added to those of Linnæus, but only among the univalves; the genus *Nautilus* being divided into three, and that of *Buccinum* into the same number. These alterations are strictly reconcilable with Linnean principles, yet it may be reasonably doubted how far they are *necessary*.

At the head of those writers who have contended for what may be called the *natural* system of Testaceology, or a system founded on the stucture and habits of the inhabitants of shells, may be placed

OTHO FREDERIC MÜLLER,

one of the most laborious and sagacious zoologists of his age. In his "*Vermium terrestrium et fluxiatilium Historia*" we have a sketch of his proposed arrangement of the land and river *Testacea*, which, according to this author, form two very distinct orders, though not differing from each other so widely as the fresh-water and the maritime. The characters of his *genera* are taken chiefly from the shape of the *tentacula* of the animals; in the bivalves, from the *siphon* which they protrude. Hence the Linnean *genus* *Limax* is included in the testaceous instead of the molluscou order. The work in which these outlines are given is published in two volumes, the first begun in 1773, and the second in 1774: the latter relates solely to the subject of which we are treating; and its preliminary matter, in a physiological and anatomical point of view, is of a very curious and instructive nature.

In 1776 our author printed a *Prodromus* of the Zoology of Denmark, containing concise descriptions of every known species in-

habiting that country, with the names by which they are therein vulgarly designated, as well as those which serve the purposes of system. The *Testacea* are arranged under thirty-six *genera*, of which ten are of our author's own construction, and derived from his peculiar method of arrangement; the others agree with the Linnean classification.

This work was followed a year afterwards by the first *fasciculus* of his "*Animalium Daniæ et Norvegiæ rariorum ac minus notorum Icones.*"

The *Zoologia Danica* was completed in 1779. It describes at considerable length all the new and most remarkable species; and, agreeably to the author's scheme of Testaceological arrangement, the contained animals are not less minutely noticed than their shells. The *Icones* were re-edited in 1781 in the same volume with a folio history of the species which they represent; forming, in fact, the Danish Zoology. We cannot conclude our account of Müller's labours on the subject of the *Testacea*, without expressing our admiration of the fidelity and perseverance with which he has added to our knowledge of that order of animals. No observer has hitherto done so much towards rendering us fully acquainted with their structure and œconomy; and though, as the basis of a system, his researches are not susceptible of so useful and general an application as the more artificial method of Linnæus, they cannot fail to be of permanent importance to the common stock of natural science.

FORTIS,

the Dalmatian traveller, has given a few good figures of *Testacea*, to illustrate the description of those species which he found in the *Porto di Bua*.

FORSKÅHL,

FORSKÅHL,

the celebrated traveller, also attended to this subject. In the description of the animals observed on his journey in the East, we find nearly thirty shells, though few of these were new. Among his *Icones* are figures of some of them and their contained animals, but they are very slightly executed.

There is a good figure of *Helix cornea*, with the animal, in the *Naturkundige Verlustingen* (or Naturalist's Amusements) of

SLABBER,

who has given some remarks on this species.

We must not omit noticing the *Zoophylacium Gronovianum*, a description of the rich museum of

LAUR. THEOD. GRONOVIVS,

senator of Leyden, where this volume was published in 1781. It contains plates (of the rarer objects), among which are two of shells, with upwards of twenty correct figures; and there is an excellent scientific description of 589 species, conformable to the Linnean method. Some of these have not been described by any other author.

DE JOUBERT,

the author of a "*Mémoire sur une Coquille de l'Espèce des Poulottes pêchée dans la Méditerranée,*" merits the same remark as has been made with respect to his countryman Fougeroux, and his memoir occupies the same work. It relates to recent and fossil *Anomia*, of which there are several figures.

KÄMMERER,

a German testaceologist, described the collection of the Hereditary Prince of Schwarzburg-Rudolstadt. Though the work be

little more than a catalogue, it is adorned with very good figures, and many of the species are of considerable rarity. It is wholly in the German language. The plates are twelve in number, exclusive of the four subjoined to an appendix to this work, published at Leipsic under the title of "*Nachtrag zu der Conchylien im Fürstlichen Cabinette zu Rudolstadt.*"

The *Fauna Groenlandica* of

OTHO FABRICIUS

deserves a distinguished place among Testaceological works, as it contains an ample and satisfactory description of fifty-seven species of shells, some of which had not been described by any author before. The arrangement is that adopted by Müller; and, like him, Fabricius pays minute attention to the structure and habits of the contained animals.

We are indebted to the celebrated

PALLAS

for the description of several new species of *Testacea*, in his *Miscellanea Zoologica*, and also in the *Spicilegia Zoologica*; and he has not contented himself with making known non-descript species, but has, moreover, rectified the accounts given by preceding authors of others well known before. Few labourers in the paths of natural history have more largely extended every branch of it than this truly scientific observer. The Testaceologist will consult with much satisfaction his remarks on the *Serpulæ*, contained in the work first mentioned, and called forth by the occasion of describing that remarkable species the *S. gigantea*. He adduces many anatomical facts which seem to have been unknown to Linnæus, and which occasion some anomalies in that genus. The 10th *fasciculus* of the *Spicilegia* contains good figures of some rarer shells

shells of different *genera*, and also accurate descriptions. There are histories of new species by the same author in the *Nova Acta Acad. Petrop.*, with figures. These species are *Serpula Spirillum*, *Lepas cariosa*, *Pholus Terebula*, *Chiton amiculatus*, and *Helix coriacea*.

The 64th volume of the *Philosophical Transactions* contains some curious facts relative to what has been called the *reviviscence* of snails, communicated to the Royal Society by

DR. MACBRIDE.

This is a subject more particularly interesting to the physiologist, but cannot be considered as foreign to the science of Testaceology in general.

The following year the celebrated

BONNET

published some experiments on the regeneration of the head of the common Land-snail, which appear among his other works. These experiments were pursued likewise by Müller in the *Journ. de Physique*, and by

J. AND. MURRAY,

in a *Programma*, at Göttingen, the year after Bonnet's observations appeared.

This is the proper place to notice the labours of our countryman

PENNANT,

whose *British Zoology* is the earliest work professing to treat of the animals of our island after the Linnean method, and who ought, therefore, to be considered as having commenced a new æra among English naturalists. The three first editions of this
work,

work, however, did not comprehend any of the *Vermes*, and it was not until the year 1778 that a 4th volume made its appearance, with descriptions and figures of that tribe. This volume contains an enumeration of 163 species of *Testacea*, with concise descriptions, and 56 plates exhibiting about 200 figures of them. Most of these plates are valuable for reference, but some of them are executed less carefully than could have been wished. In the descriptive part the author has translated pretty closely the specific characters given by Linnæus, whenever they could be had; but there are several species of which the former is to be looked upon as the first describer. It is very remarkable, however, that he should have wholly omitted others which had been noticed by Lister and Pctiver, and which are unquestionably natives of our island.

In the *Nova Act. Reg. Soc. Scient. Upsal.* we find a description of *Anomia Caput Serpentis* by this author, with a figure subjoined. It may be remarked that the same shell is described in the same volume by the pen of Linnæus, whose figure (with those of *Anomia patellaformis*, noticed in the same paper,) occurs in the plate that contains Pennant's.

We have next to mention the *Introductio ad Historiam Naturalem*, and the *Deliciæ Faunæ et Floræ Insubricæ*, of the learned

SCOPOLI,

both of which are the productions of great science, aided by genuine ardour of investigation. Scopoli was well acquainted with the labours of his predecessors in Testaccology, as well as in other branches of natural history, and has availed himself of them towards perfecting the system of Linnæus, whose *genera* he has considerably augmented,—more so, perhaps, than is consistent with the general simplicity and facility of application of the original.

ginal. For such of Linnæus's terms as have justly been considered objectionable, on account of indelicacy, this author has substituted others which, though not equally expressive, perhaps, are sufficiently intelligible. In the specific descriptions, the shell and the animal have been alike regarded; and the author seems to have steered a sort of middle course between the advocates for a system founded chiefly on the former, and those who have made the latter the chief subject of their attention.—Our remarks hitherto have had respect only to the *Introd. ad Hist. Nat.* In the other work the merit consists in the figures, which are finely drawn, and contribute greatly to the general splendour of the volume. Plate 25 of Part I and 24 of Part II exhibit solely shells, correspondent to concise descriptions of seven remarkable species.

The period of which we are treating was peculiarly productive of valuable publications in Testaceology. In 1778

BARON BORN,

so well known by his writings on mineralogy, presented to the public his description of the shells preserved in the museum of the Empress Queen at Vienna. This work was undertaken by the express command of Her Imperial Majesty, and forms a thick octavo volume, in Latin and German. The author has closely followed the Linnæan method, and his descriptions exhibit the peculiar terseness and precision introduced into natural history by that great writer. His synonyms are copious and correct, and he does not appear to have fallen into that frequent error among naturalists—the undue multiplication of species. In this work the number of the latter is 616, and references are made to them by their German, Dutch, French, and English names, in four distinct *indices*.—Two years after the publication of the descriptive

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scriptive part of the museum, appeared the sumptuous and splendid folio which illustrates it by eighteen admirable engravings (containing upwards of 200 coloured figures), besides vignettes and other ornamental appendages. This volume cannot be said to have been surpassed by any similar performance, either in elegance or utility, and may justly be considered as one of the most valuable works of which the lover of shells can become possessed.

In 1776 were published the "*Elements of Conchology*" of

DA COSTA.

As this author wrote after Linnæus, it might be expected that a system, in which he professes to differ materially from that great naturalist, would have contained some important improvements. It is worthy of remark, however, that, after abusive strictures on the Linnæan system, Mr. da Costa builds his own chiefly on the general characters which Linnæus himself has made use of. For example, the turbinated univalves are characterized by the shape of the aperture, and the bivalves by the nature of the hinge. When the student is informed that he must make himself acquainted with four orders, sixteen families, and thirty-nine *genera* of univalves, and with three orders, sixteen families, and twenty-three *genera* of bivalves and multivalves, before he arrives at specific distinctions, none of which our author considers in this performance, he will most probably abandon the new system in disgust. It cannot but be acknowledged that the volume contains some judicious remarks on the study of this branch of natural history, and on the authors who have treated of it. There are also useful instructions for collecting, cleaning, and preserving specimens. Still more acceptable to the public were two other works of this author; one of which, however, was on too extensive a scale to admit

admit of being completed; we mean the "*Conchology or Natural History of Shells*," which was published, anonymously, in folio numbers, but never proceeded beyond twenty-six pages of letterpress and twelve plates. The shells figured are chiefly of the genera of *Patella*, *Haliotis*, and *Serpula*.—The *British Conchology* was the work that conferred most reputation on this writer; and it certainly formed a valuable addition to the natural history of our island. He has described many species not noticed by Pennant, yet some of these are not well ascertained to be natives of Great Britain; nor are Linnæus's synonyms in every instance correctly applied. He follows the system laid down in his *Elements of Conchology*. The descriptions are minute and accurate, and calculated for both the English and the French reader, each of those languages being employed throughout the volume. It is much to be wished that every species mentioned in it had been figured, especially as the plates exhibit 124 species out of the 152. These plates are 17 in number, and coloured; but the accuracy neither of the engraving nor of the colouring is much to be commended. For the most part, however, the subjects are pretty readily recognizable.

We are glad to have to record in these Testaccological memoirs the name of a female physiologist,

MASSON LE GOLFT,

some remarks by whom on the re-production of parts of Muscles occur in the *Journal de Physique*.

The same work contains an account of lithophagous marine animals, written by

DICQUEMARE.

The locomotive faculty of certain *Ostrea* is treated of by the same author in the 28th volume of the abovementioned journal.

MOLINA,

in his Natural History of Chili, includes the *Testacea* of that country, which he has described in a scientific manner.

The reproduction of the head of the common Snail, a subject to which the attention of physiologists had been first directed by Bonnet, occupied at this time the notice of one of the most sagacious observers of the age, the justly celebrated

SPALLANZANI,

whose experiments and observations may be found amply detailed in the *Mem. della Soc. Ital.* for the years 1782 and 1784. This valuable paper contains a variety of very curious facts; and the first part of it is illustrated by nine figures, which exhibit various states of the decapitated animal.

In recording the description given by

GIOENI

of a new genus found on the shores of Catania, we have, unfortunately, only to commemorate a very remarkable mistake made by that naturalist, the supposed new genus having been discovered to be merely the gizzard of *Bulla lignaria*, so well described by our countryman, Mr. George Humphreys, in the 2d volume of the *Linnean Transactions*. This detection of the mistake, however, was not made until seventeen years after the publication of Gioeni's book. So little suspicion was entertained of the substance thus brought to notice not being a real shell, that it obtained a scientific name as such (*Triola Gioenii*) from Professor Retzius, and occupied a place in the system of the late M. Brugiere, under the appellation of *Gioenia Sicula*. For the ascertaining of its real nature we are indebted to M. DRAPARNAUD, whose account may be found in the *Nouv. Journ. de Physique*.

LIGHT-

LIGHTFOOT

(well known from his *Flora Scotica*) was author of a description of five species of *Testacca*, either wholly unknown to, or not duly noticed by, any of his predecessors. This gentleman was deservedly considered as one of the most able Linnean scholars of his time, and, from his constant opportunities of access to the Portland museum, had rendered himself particularly conversant in conchology; a circumstance sufficiently evinced in the paper of which we have been speaking, and which appears in the 76th volume of the *Philosophical Transactions*. The figures, also, accompanying the paper are very correctly drawn.

In the year 1784

MARTYN,

a dealer, began one of the most beautiful and costly conchological works this country has ever seen. It bears the title of the *Universal Conchologist*, and was intended to exhibit a figure of every known shell, drawn and painted after nature. The author began with the non-descript species collected in the different voyages to the South Seas after the year 1764. His work is prefaced with general remarks, in French and English, an account of the more remarkable cabinets of shells existing in Great Britain, and some observations relative to Testaceological writers. It contains also explicatory tables, exhibiting the name of each shell, according to the author's system, the name it bears in the Linnean, the degree of rarity, the *habitat*, and the collection in which it was found. But, before this ingenious artist had completed his two volumes of South Sea shells, he discovered the impossibility of procuring purchasers sufficient to compensate him for his labour and expense,—a misfortune generally experienced by private individuals who embark in such extensive and sumptuous undertakings. He, therefore, did not proceed beyond 160 plates;

which, however, as they include all the species then known to the southern navigators, may be considered as constituting a complete work, so far as it goes, and it was all that Mr. Martyn had absolutely *engaged* himself to execute. There is only one species on a plate, but each is exhibited in different aspects, with incomparable elegance, and with great correctness of drawing and colouring.

In the same year with the first volume of the *Universal Conchology* appeared a description of the minute shells found on the Sandwich shores by

WILLIAM BOYS,

with whose name ought also to be joined that of

GEORGE WALKER,

by whom considerable additions were made to the observations of Mr. Boys, and who drew the figures. This work contains three plates, exhibiting ninety species (inclusive of three *Mollusca*), both of the natural and of a magnified size. Each species is concisely described in Latin, agreeably to the Linnean method, and accompanied by some observations in English relative to colour, degree of rarity, &c.

LEFEBURE DES HAYES

gave a very full description, accompanied by figures, of the *Chiton squamosus*, which will be found in the *Journal de Physique* for 1787.

The "*Nova Testaceorum Genera*" of Münter Philipsson were published, as an Inaugural Dissertation, at Lund, under the Presidency of

RETZIUS.

This performance contains many judicious remarks relative to the Linnean *genera*, which the author proposes in some instances
to

to divide; and he forms three from the authority of Linnæus himself, if Acharius (by whom the information of Linnæus's intentions was communicated to Retzius) be correct. There can be no doubt that the *Mya Perna* of the *Syst. Nat.* admits of being made a distinct genus, under which may, very properly, be comprehended some of the ventricose species of *Mytilus*. The appellation of *Perna* is accordingly given to this family, and that of *Unio* to the two perlaceous species of *Mya*, viz. *Margaritifera* and *Pictorum*. The four last species of the original genus *Ostrea* appear to have been afterwards intended by Linnæus to form another family, to be called *Melina*. According to our author, the *Anomia* consists of four very different divisions of shells, which he proposes to designate by the generic terms of *Anomia*, *Crania*, *Terebratula*, and *Placenta*. By turning to the *Anomiæ* as they stand in the 12th edition of the *Systema*, the reader will easily discover what species are meant to be comprehended under each of these genera; and how partial soever he may be to the original arrangement of Linnæus, he will not be disposed, perhaps, to accuse the Testaceologist of whom we are treating of any rashness of reform.

There is a scientific description, with figures, of *Venus lithophaga*, published by the Professor in the *Mem. de l'Acad. Roy. des Sc.* for 1786.

In the same work for 1788 we find an author of the name of

LE GENTIL,

who describes a *Patella* (apparently the *cæruleata*) found on an aquatic plant, which, with the shell, is figured in the 20th plate of that volume.

CORDINER.

In the plates accompanying Mr. Cordiner's Description of Ruins, &c. in North Britain are several figures of *Testacea*, which are

are represented with the animals for the most part complete; but the engravings are slight, and the shells are intermingled with Zoophytes.

The microscopic subjects described by

SOLDANI

are principally shells, which this author discovered at Portoferara, the island del Giglio, and on the shores of Castiglioncello, la Follonica, &c. The work does not exhibit much method or science; but the species figured in it are extremely curious, many of them being wholly unlike any of the larger and well known ones. There are 148 plates, in which the shells are represented both of their natural size and magnified.

As a physiological dissertation on the subject of *Testacea*, the letter of

BONVICINI

to Professor Girardi, inserted in the *Mem. della Soc. Ital.*, ought to be mentioned here. It contains several curious experiments relative to the organ of sight in the Snail tribe.

In the "*Magazin Encyclopédique*" some facts respecting the life of the *Lepas anatifera* may be found. They were communicated by

M. MESAIZE,

who seems to have had opportunities of paying considerable attention to this singular species.

With the year 1789 commenced the Helminthological part of the grand work carried on in France under the title of "*Encyclopédie Méthodique.*" This department had been undertaken by

BRUGUIERE

(the well known traveller in the East), who appears to have been fully qualified for the completion of the laborious task; but, unfortunately

fortunately for natural history and his nation, he was cut off by a premature death, just after he had completed the 1st volume (which does not go beyond the letter C) of the article *Vers.* In the preface to this article we are presented with the method of arrangement which he intended to have pursued, and which is obviously founded on that of Linnæus: in fact, the author professes to deviate from it no further than he conceives himself to be required by the discoveries subsequent to the publication of the *Systema*. The number of *genera*, however, in the French zoologist's order of *Testacea* is nearly double that of Linnæus's, being sixty-one instead of thirty-six. Only two *livraisons* of plates containing shells have hitherto come to our hands; but such is the originality of the figures, and the excellence of their execution, that, incomplete as they are with respect to the letter-press, they form by themselves a very valuable work to be referred to by other authors.—There occur some interesting papers relative to *Testacea* by M. Bruguiere in the *Journal d'Hist. Nat.* (of which that gentleman was a principal conductor); in one of these he has treated, at considerable length, of the formation and growth of the *Porcellanea*, adducing a variety of new and curious facts on that subject.

The “*Naturalist's Miscellany*” of our countryman

DR. SHAW

is too well known to require any detailed mention in this paper; and, even if it had not been inconsistent with our plan to have discussed the merits of contemporary English authors, we could not, with propriety, enter upon an analysis of a work which is not yet completed. We shall, therefore, content ourselves with pointing out its place in the general history of Testaceology.

The

The "*Zoologia Adriatica*" of the Abbé

OLIVI

deserves a place among Conchological performances, for it contains a very scientific account of all the shells found in the Gulf of Venice. This author makes known seven new species, which are well figured, and very fully described.

It was not reserved for the anatomist alone to illustrate the physiology of the testaceous tribe, for chemistry now began to lend its aid towards extending and improving this interesting subject of inquiry. In the *Ann. de Chimie* we find

M. VAUQUELIN

treating of the respiratory process in the *Helix Pomatia*. This eminent chemist proves, in the course of his observations, that the *Vermes* require vital air for the excitement of their pulmonary system as well as other animals, and that they cannot live without it. But the most curious fact is, that the species above mentioned will respire azotic and carbonic acid gas as long as any oxygen remains combined with either;—whence M. Vauquelin is induced to think that this *Helix* may be a good eudiometer.

The *Journal d'Hist. Nat.* for the same year contains an article entitled "*Observations sur la Génération des Buccins d'Eau douce,*" from which observations

M. RIBAUCCOURT,

the writer of them, is induced to conclude that all the species of that tribe are viviparous. The *second* volume of that instructive work has the anatomy of *Patella vulgaris*, which is written by

M. CUVIER,

and illustrated by a plate, representing both the animal and the shell in various points of view. This very able comparative anatomist

tomist has distinguished himself by other dissections of *Testacea*, which will be found in the *Annales du Museum National*, and which we have much satisfaction in particularizing. His first memoir in that journal relates to the animal of *Lingula anatina* of Lamarck (*Patella Unguis* of Linnæus), the parts of which are admirably exhibited in the 17th plate. In the subsequent number *Bulla aperta* (*Bullæa* of Lamarck) is described and figured with equal ability. It is by such minute and accurate examinations that species are definitively fixed, and we cannot forbear expressing a hope that M. Cuvier will continue to present us with other examples of the successfulness of his researches among this still imperfectly known order of animals.

Several minute and other shells not before known are described in the *Trans. of the Linn. Soc.* by

JOHN ADAMS,

who discovered them on the coast of Pembroke-shire. The descriptions, which are perfectly scientific, are accompanied by figures. In mentioning the name of Mr. Adams, the authors of the present paper, who were so fortunate as to enjoy his correspondence on Testaceological subjects, cannot omit paying a tribute of respect to his memory, from having witnessed the enthusiasm and perseverance with which he pursued the study of nature; nor can they help reminding their fellow-members of the loss they sustained in the untimely death of one who gave such unequivocal proofs of usefulness and ability.

It is a task as laborious as it is unlimited to push the examination of natural objects beyond the ordinary powers of the senses; and it may, perhaps, be questioned by some, whether such pursuits lead to any useful practical purposes: yet the supplying of

links in the chain of organized creatures, the multiplication of analogies, and the tracing of changes produced in the different stages of the growth of animals, cannot fail to give curious and interesting results to the profound naturalist. The investigation of microscopic shells, so zealously pursued by a Plancus and a Soldani, has been taken up with no small success by

M. M. LEOPOLD À FICHEL

AND

J. P. CHARLES À MOLL,

whose elegant and instructive work on this subject deserves particular mention, since it is to be considered as the fullest catalogue of minute *Testacea* that has yet been published. It is embellished with beautifully coloured plates, which represent the several subjects both of the natural and of a magnified size. The descriptions are given in two languages (viz. the Latin and the German), and we must not omit our tribute of applause to the ingenious authors for having thus shown a respect for the scientific world in general, as well as for their own countrymen in particular. It is an example which, as we have before ventured to remark, ought to be universally adopted; unless the advantages of knowledge are intended to be purely local, like that which relates to the trade and traffic of nations; or unless it be thought necessary for human life to be wholly occupied in the acquisition of languages. The *genera* of *Argonauta* and *Nautilus* form the principal subjects of this volume; and many species appear under each of these which had been either not duly observed, or wholly unnoticed, by preceding writers.

M. LAMARCK,

M. LAMARCK,

whose sentiments respecting the Linnean Testaceology we have quoted (in a former part of this paper) in support of our own, has strong claims to a distinguished place among the writers on this branch of pursuit. The *Journal d'Hist. Nat.*, *Mem. de la Soc. d'Hist. Nat. de Paris*, and the *Annales du Mus. Nat.* contain sufficient proofs of the close attention which he has paid to the order of *Testacea*. In the first of these works we find some judicious remarks of this eminent naturalist on the Testaceological system of Bruguiere, and in the second he has presented us with a sketch of the method adopted by himself. Whether the number of the *genera* employed in the latter (which are sixty-three more than are used in the former) ought to be a ground of preference, we do not presume to determine; but the system of M. Lamarck must be considered as an entire new modelling of the Linnean; and we cannot help questioning whether it has improved the perspicuity of the original. In the *Ann. du Mus. Nat.* M. Lamarck has described a new genus belonging to his order of *Crustaces conchyliferes* under the name of *Tubicinella*.—It is from this author that we may expect the continuation of the article *Vers* in the French *Encyclopedie*, so unfortunately interrupted by the death of M. Bruguiere.

WILLIAM GEORGE MATON

has described, in the *Trans. of the Linnean Society*, a species of *Tel-
lina* not noticed by Linnæus. In his *Observations on the Western
Counties* frequent mention is made of *Testacea* found in that district; some of which had not been described as natives of the British islands before; and *Turbo rudis* is here first made known as a new species.

MR. HATCHETT

is the only author, with whose writings we are acquainted, that has scientifically investigated what may be called the chemical characters of shells; a comparison of which with those derived from external structure, cannot but be highly curious and interesting to the philosophical naturalist. To the disciple of Linnæus it is peculiarly satisfactory to perceive that so many of Mr. Hatchett's experiments tend to establish the propriety of distinctions adopted by that illustrious naturalist. We would only refer the reader to the instance of the *Echinus*, the chemical characteristic of which genus proves, in opposition to Klein, the correctness of Linnæus, in placing it among the crustaceous instead of the testaceous tribe; the presence of the *phosphate of lime* detected in the covering of the *Echinus* distinguishes the latter from testaceous substances, which consist only of *carbonate* of lime mixed with the gelatinous matter. When one science can thus be made to remove unavoidable ambiguities in another, a beautiful example is established of the intimate connection that subsists between all the various branches of natural knowledge.

In the year 1799

MR. DONOVAN

began the publication of the *Natural History of the British Shells*, including figures and descriptions of all the species hitherto discovered in Great Britain, systematically arranged in the Linnæan manner, with scientific and general observations on each. Of this work five volumes in octavo have appeared, comprising 180 plates, with coloured figures; but, as it is not yet completed, we have only to observe, that the author has given several new species, and that he has rectified many errors of preceding writers.

The

The student will find much useful illustration of the generic characters of bivalves in the 6th volume of the Linnean Society's Transactions; in which

MR. WILLIAM WOOD

has described and figured the *hinges* of such shells of that division as are found in Great Britain.

M. DUFRESNE.

From this writer we have some remarks on the *genera* of *Tubicinella*, *Cornula*, and *Balanus* (of Lamarck), with admirable figures of *Coronula Balanaris* and *Tubicinella*, in the *Ann. du Museum*. The communication is entitled "*Notice sur les Balanus.*"

The last writer whom we have to record in this historical account is

GEORGE MONTAGU, ESQ.,

who, by indefatigable perseverance in his researches, and by a long residence near the sea coast, has been enabled to make considerable additions to the British *Testacea*, and to gratify the zoologist with descriptions of, and various particulars relative to, many of the animals of that order whose history was much less perfectly known before. He has enumerated nearly 470 species; upwards of 100 of which had either not been described by any former author, or had now first been ascertained to be British. Sixteen coloured plates accompany the work, on which are delineated some of the shells described, but not figured by former writers,—a few already known, which are necessarily introduced for the sake of comparison,—and many first discovered by Mr. Montagu himself; of the latter, however, about thirty are unaccompanied by figures. This author adopts the Linnean system; but has deviated from it in placing many Linnean *Helices* under the genus
Turbo,

Turbo, and arranging all the depressed species of the former without regard to the shape of the aperture. A new genus (*Vermiculum*) is introduced for the purpose of containing such of the *Serpulæ* as do not agree with the generic character of being fixed to other bodies. The whole of the work is in the English language; so that the author cannot be said to have employed the Linnean terminology (strictly so called) or the Linnean mode of description; but this is a circumstance which will not be regretted by ordinary readers.

N. B. In the following *Systematical* enumeration of Testaceological writers, and of their works, the numbers annexed to the names of the former refer to the pages in the preceding account wherein these writers are respectively mentioned.
